

THE IRON AGE

New York, May 17, 1917

ESTABLISHED 1855

VOL. 99: No. 20

Where Munition Making Will Be Discussed

Cincinnati as a Machinery Making Center and the Interest It Offers to Next Week's Meetings of Mechanical Engineers and Machine Tool Builders

BY C. L. SMITH

(With Supplemental Plate)

THE building of river boats early became quite an industry in Cincinnati, and in 1848 Miles Greenwood, a pioneer citizen, operated in that city a large machine and woodworking shop, as well as a brass and an iron foundry, employing over 500 men. Boat building and machine shops used the simplest kind of machines, which were generally of their own construction. It was not until 1853 that

the city directory of Cincinnati listed machine tools and then it mentioned the firm of Steptoe & McFarland, which firm was formed more than a year previous.

The history of the machine tool industry from that time to the present is replete with interesting facts. Chief among them is the approximately large percentage of men who started out in the pio-

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Some Well-Known Names of the Machine Tool Trade May Be Noted on These Pages from the Cost Record Book of John Steptoe & Co., Cincinnati. They cover apparently the labor charges for a group of machines in each case, showing the number of hours per individual and the hourly rate of pay

neer days as machinists and later established plants of their own that are still in existence. Many of these plants are yet under direct supervision of their founders.

In 1848 John Steptoe, a native of Oldham, England, arrived in this country and shortly afterward located in Cincinnati. As a foundling he was left on a doorstep, hence his name; and it was one of which he was said to have been peculiarly proud. He entered the employ of Miles Greenwood, and in the early fifties organized the firm of Steptoe & McFarland to make foot-power mortising machines, but later branched out into making lathes, planers and other machine tools. From information furnished by the late William Lodge, of the Lodge & Shipley Machine Tool Company, John Steptoe operated the first plant west of the Allegheny mountains devoted to the manufacture of machine tools. This shop proved to be an educational institution for many machine tool builders who are well-known not only in this country but throughout the entire civilized world.

The accompanying photographic copy of two

These are only a few of the graduates of the John Steptoe Company, under which name it is now operated, who established plants of their own in Cincinnati, as several other of the early employees of the firm moved to different industrial centers. John Steptoe, at the time of his death in 1890, was rightfully termed the dean of the machine tool builders in Cincinnati.

The scale of wages paid 45 to 50 years ago for a day of 10 hours is somewhat different from that in force to-day, and the records of the Steptoe Company show that the average for all labor from 1868 to 1873 was very close to 25 $\frac{3}{4}$ cents per hour.

In the early days all of the machine tool plants were located in the business district of the city, but rapidly increasing business forced many firms to remove to locations in the western part of the city in order to obtain room for expansion. For that reason on both Spring Grove and Colerain Avenues quite a number of plants were built. About 10 years ago an organization was formed to establish an industrial center at Oakley, a suburb seven miles from the center of the city. The original members



F. A. GEIER



C. WOOD WALTER



J. B. DOAN



A. H. TUECHTER

COMMITTEE OF ARRANGEMENTS FOR CINCINNATI MEETING OF THE NATIONAL MACHINE TOOL BUILDERS' ASSOCIATION

pages of the original cost account book covering periods in 1872 and 1873, contains numerous familiar names to the machine tool trade. James Mills, who was a foreman in the Steptoe & McFarland shop, and who only died recently, was one of the organizers of the Smith & Mills Company, makers of shaping machines. His partner, A. S. Smith, was also employed in a different department of the plant.

W. Oesterlein is none other than the present president of the Oesterlein Machine Tool Company. William Barker, whose name also appears, was a member of the firm of Lodge & Barker, which plant is now operated by the American Tool Works Company, after having passed through different organization names. Mr. Barker, at the time of his death two years ago, was the head of William Barker & Co., lathe builders. Ed. Gang is now better known as W. E. Gang, and helped organize the firm of Dietz & Gang, for building engine lathes, which firm was later changed to Dietz, Schumacher & Boye and is now operated under the name of the Boye & Emmes Machine Tool Company. W. Steubing is William Steubing, now president of the Steubing Machine Company, manufacturer of printing machinery.

On the second sheet no one will overlook the name of W. Lodge, an active member of the Lodge & Shipley Machine Tool Company at the time of his sudden death on April 30.

of this organization were as follows: Cincinnati Milling Machine Company, Cincinnati-Bickford Tool Company, Cincinnati Planer Company, Triumph Electric & Ice Machine Company and the Modern Foundry Company. Later the Cincinnati Ball Crank Company, the Alvey-Ferguson Company and the Cincinnati Lathe & Tool Company moved their plants to Oakley, all of which plants are furnished with power, light and heat from a central generating station.

In spite of the high cost of labor and building material, quite a number of machine tool plants have either built new plants or made additions to their old ones within the past two years. Among new plants now under construction may be mentioned those for the Champion Tool Works Company, the Carlton Machine Tool Company, the R. K. LeBlond Machine Tool Company, the Cincinnati Grinder Company and the American Tool Works Company. Additions have also been made to a number of plants and a large one is now under way to the plant of the Cincinnati Planer Company. It is conservatively estimated that when all of these plants have been completed the output of machine tools in Cincinnati will be close to 200 per cent over the record 10 or 12 years ago.

Attention may well be called also to the manufacture of portable electric drilling and grinding machines in Cincinnati. The Hissey-Wolf Machine Company, it is believed, was the first concern in

the country to manufacture these machines in any quantity, and at the present time there are five firms now engaged in the business.

The city will be the mecca of mechanical engineers and the machine tool builders of the country next week to participate in the conventions which will open on Monday of the American Society of Mechanical Engineers and the National Machine Tool Builders Association. References to the program of these meetings have already been made in THE IRON AGE and the object of the foregoing is to outline what special interest Cincinnati affords in addition to the meetings themselves. In an accompanying plate is a map of the city, locating the machinery-building industries, with supplementary information covering the kind of products of each company.

Program of Machine Tool Builders

While the real activities of the mechanical engineers meeting, the program of which was given in last week's issue, do not begin until Tuesday morning, May 22, when a joint session on munitions making will be held with the National Machine Tool Builders' Association, the latter association has a full program for Monday. Headquarters have been established at the Hotel Sinton, Cincinnati.

Costs in Machine Tool Building

The addresses announced for Monday morning

are as follows under the general heading "Elements of Cost in Machine Tool Building":

"Pig Iron," by James Albert Green, Matthew Addy & Co., Cincinnati.

"Steel," by Royal Mattice, manager of sales American Steel & Wire Company, Cincinnati.

"Machine Shop Supplies," by W. J. Radcliffe, president E. A. Kinsey Company, Cincinnati.

"Lumber," by Col. S. B. Stansbery, Cincinnati manager, Chicago Lumber & Coal Company.

"Labor," by Murray Shipley, Lodge & Shipley Machine Tool Company, Cincinnati.

At the Monday afternoon session, William Hard, of the *Metropolitan Magazine*, New York, is to deliver an address on "The Lessons and Opportunities of the World's War for the American Manufacturer." He will be followed by H. W. Dunbar, chief engineer Norton Grinding Company, Worcester, Mass., whose subject will be "Safety Devices for Machine Tools." Z. Chafee, Diamond Machine Company, Providence, R. I., will speak on "Trade Acceptances."

The session on Wednesday will be devoted largely to association business. The committee on arrangements is composed of J. B. Doan, president of the association and president and general manager of the American Tool Works Company; F. A. Geier, president Cincinnati Milling Machine Company; August Tuechter, Cincinnati Bickford Tool Company, and C. Wood Walter, Cincinnati Milling Machine Company.

Outside Plant Lighting in War Time

Principles Involved in Planning Installations—Suggestions for Centrally Located Factories and Those in Outlying Districts

AS a result of a number of requests for recommendations as to the proper use of artificial light about industrial plants for protective purposes in times of war, the engineering department of the National Lamp Works of the General Electric Company has issued a bulletin containing suggestions covering the subject. Extracts dealing with various phases of the subject are given below.

General Considerations

There are certain general principles of illumination that must be observed in this as well as in other fields of lighting regardless of the type of installation used. An object is seen in detail by the light which comes from it to the eye and not by the light that comes from the light source to the eye. The aim is, therefore, to throw the light upon the object to be seen and have as little as possible of the light coming directly from the source to the eye. An object is often discovered, however, in silhouette, that is by light coming to the observer not from the object but from a location beyond it.

Glare, which is the result of a light source extremely bright with respect to its surroundings located directly in the field of vision, must be avoided. It is best overcome in the case of protective lighting by mounting the units at a sufficient height to bring them above the ordinary angle of vision and by shading the lamps with suitable reflectors.

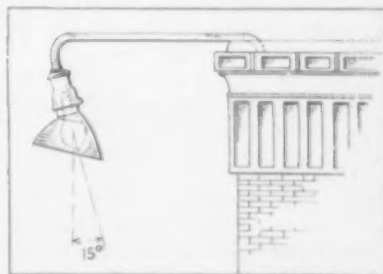
In addition to minimizing glare effects, reflector equipment serves the important purpose of distributing the light which emanates from the lamp filament in all directions into those where it is most useful. For protective lighting purposes, five main types of reflectors are especially useful. These are the opaque angle reflector, giving a broad distribution of light directed principally to one side of and below the unit and suit-

able for illuminating fairly large areas; the opaque dome-shaped reflector which gives a broad symmetrical distribution of light and is suitable for illuminating fairly large areas beneath and on all sides of the unit; the refractor unit which gives a broad symmetrical distribution and is suitable for illuminating large areas with wide spacing distances between the units; the flood-lighting projector giving a concentrated distribution in which the light is confined principally to a beam of about 25 to 30 deg. in width and capable of illuminating objects a considerable distance away, and the searchlight, giving a highly concentrated distribution in which the light is confined to an extremely narrow beam capable of illuminating comparatively small objects at great distances.

A number of good reflectors of these types are on the market at present. Good results can be obtained from any of those of reliable manufacture and the ease and promptness with which the units can be obtained will probably have greater weight with the plant owner than small differences in efficiency.

Centrally Located Plants

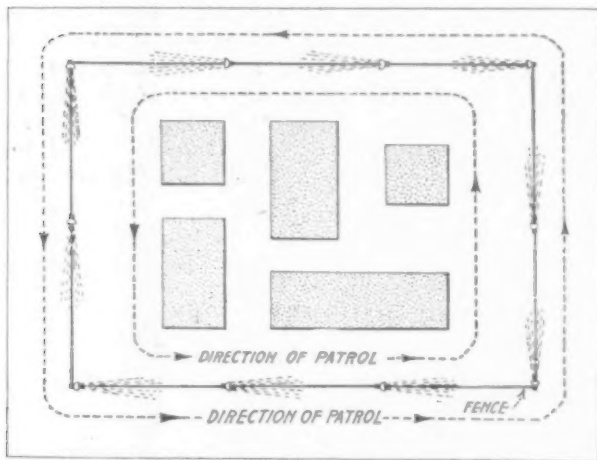
Where a plant is located in a city factory block with the building close to the street and occupying all or a



Tipping the Reflector Slightly Serves to Screen the Filament from the View of Those Facing the Unit from a Distance While the Light Is Directed Away from The Building

considerable portion of the block, the buildings on the opposite side of the street make it impossible to place a zone of light at any great distance from the plant, and in fact, the zone will have to be confined to the width of the street. The street lighting, if of a high standard, may furnish all the protective lighting required except in obscure nooks and corners where local illumination will be needed. In most cases the lighting units may be mounted on the building itself and the light distribution should be such that the full width of the street will be illuminated. The first type of reflector is best adapted for the purpose. Consideration for the comfort of those who rightfully use the street, as well as that of the guards, necessitates mounting the lighting units well above the line of vision of those who pass near the building and screened from the view of those who see the building from a distance. In many cases if the units are tipped at a slight angle, as illustrated, the reflector will screen the brilliant filament and thus accomplish the desired results.

Hanging the units high has the advantage that a relatively small number of large ones can be spaced at greater distances with a resulting decrease in installation expense. As a general rule no advantage is gained



Installing Flood Lighting Projectors to Provide a Zone of Light is Made More Effective by Having the Guard Walk in the Same General Direction as That in Which the Light is Directed

by exceeding a mounting height of 50 ft. and with this a spacing distance of 100 ft. between units, which should range from 200 to 500 watts in size, should provide sufficiently uniform illumination. Where units are mounted near the roof of the building, or not more than 30 ft. above the ground, the dome reflector should be considered. Here the mounting height should not be less than 15 ft., and the distance between the units should not exceed two and one-half times the mounting height, and units of 100 to 200 watts each will give satisfactory illumination. If it is possible to mount the units over the center of the street, less light will fall upon the building and appreciably better illumination will result.

Dome-shaped units hung over the center of alleys between buildings or mounted on brackets extending over the alley are recommended. In such cases the mounting height should be between 15 and 30 ft., and a spacing between the units of three times the mounting height should provide sufficient uniformity. The wattage per unit should range from 100 to 500, depending upon the spacing distance and the color of the surroundings.

Plants in Outlying Districts

A greater choice as to the type of lighting system to be used is afforded by plants located in outlying districts and surrounded by an expanse of unoccupied land. The effect of glare upon the passerby may be ignored almost entirely, as very few persons pass such plants at night, and in the majority of cases those who do approach near enough to be annoyed by the glare are trespassers. The zone of light surrounding the plant need not be so closely defined and may be extended some distance to good advantage. With this zone of

light established about the entire plant, the need for illuminating each building individually is reduced, although sufficient additional light should be provided so that the guards could make their inspections with thoroughness.

One form of zone lighting consists of a series of standards surrounding the entire plant and supporting lamps equipped with reflectors. Where those of the dome type are employed, the mounting height should be not less than 15 ft. and the distance between units should not exceed 45 ft., a 100-watt lamp being satisfactory with the minimum mounting height. The higher mounting height and the use of a larger unit results in a correspondingly wider spacing and enables the advantages of lower installation cost and greater width of zone to be realized. The wattage of lamps will necessarily be increased with the mounting height and in a somewhat greater ratio.

With refractor units the minimum mounting height is 20 ft. and the spacing not more than six times that distance, lamps of 300 to 500 watts being employed. The wider distribution of these units is an advantage on account of the greater spacing, as well as increasing the zone that can be covered. Where a plant is inclosed by some type of fence, the units may be mounted on poles extending above the top of the fence and distributing the light on either side. If the units are mounted directly over the fence, dense shadows made by the fence which might furnish a lurking place will be avoided.

Flood lighting units are being employed effectively at present and possess the important advantage of extreme simplicity of installation. For zone lighting, a reflector which concentrates practically all of its light within an angle of from 25 to 30 deg. is desirable as a more concentrating reflector will illuminate too narrow a zone at ordinary mounting heights. The arrangement of these units is indicated in one of the illustrations. The guard should patrol the plant in the same general direction as that in which the light is projected and by keeping himself in the shadow he not only is inconspicuous but is spared the necessity of having to face into the beam of the bright light sources. In this scheme the higher the units are mounted the better, and units of the 400-watt size, spaced at 200-ft. intervals with a mounting height of at least 10 ft., should prove satisfactory. An installation of this type often represents the least expensive system of protective lighting that may be installed. Adequate lighting in and about the plant as a whole to provide for protective patrolling should be furnished.

Another method in which flood lighting units may be used to advantage is by mounting them at various points about the buildings and flood lighting the surrounding grounds. In this case the units are employed only to form a zone of light about the entire plant and not to furnish local lighting for the different buildings, and if they are mounted at a considerable height the matter of glare as affecting persons approaching the plant will not be serious. A modification of this last system is one in which a number of flood lighting projectors are mounted on a watch tower overlooking the grounds, thus giving a guard located in the tower a view of the lighted zone entirely surrounding the plant.

A swivel searchlight giving a highly concentrated distribution may also be used advantageously to supplement the fixed lights in penetrating unlighted areas. In this case arrangements should be made for controlling the play of the searchlight from a point several feet below the unit, as it is difficult to see objects clearly through the beam of a powerful searchlight.

The Virginia Iron, Coal & Coke Company, Roanoke, Va., is building a nodulizing plant at Middlesboro, Ky., for desulphurizing pyrites cinders. This plant is operated in connection with two furnaces already owned by the company in Middlesboro and will produce from 150 to 200 tons per day of finished nodules. The company is doing its own construction work. At Radford, Va., it is completing and has in operation a Dwight-Lloyd sintering plant, treating pyrites fines cinders at the rate of from 150 to 175 tons of sinter per day.

Some Unusual Results of Cast-Iron Tests

Accounting for Deviations from What Foundry Men Have Been Taught to Expect—How to Draw Proper Conclusions

BY PAUL R. RAMP*

AFTER a number of years with the chemist an established factor in the foundry industry, we find that the quality of gray-iron castings has not yet reached the highest point. The writer endeavors here to give a few reasons why he thinks such is the case.

Before the days of chemical analysis the foundryman would scratch his head, break a pig and tell the stock man to use it. When the chemist came he discarded the rule and secured an analysis of every car of iron in the yard, and began to get results that could be depended upon, and, better still, that could be repeated. It was then that the opinion became general, that as long as one knew what the analysis of our irons was, all one had to do was to mix them according to some rule laid down by those who knew. This caused many foundrymen to neglect this part of the business and also to ascribe every failure of castings to the quality of the metal which they did not mix.

The Foundry as a School

In order to get the full benefit of the knowledge we have of iron to-day that we did not have years ago, it is necessary to realize that the analysis of the mixture does not in any way affect the condition of the molds, and the molds must receive just as much attention and more than they ever did. It is possible for the foundry superintendent or foreman to make every heat a research lesson. If he keeps an intelligent record, it will be possible for him to solve most of his troubles himself. The services which he will require of an expert will be of additional value to him. His shop should be a preparatory school that will fit him to grasp the finer points that these very able men have sometimes to offer. The foundryman's thorough knowledge of these things will not illumine the experts, but it will cause the latter to delve deeper into the mysteries that surround the making of the best grade of cast iron. Instead of their time being consumed teaching simple principles in the foundry, they will bring to us things that we cannot get ourselves. Foundrymen are not expected to know things that cannot be studied in the shop. But they should take advantage of all they have there to study.

The fact that there are many disappointments connected with making good iron that apparently do not coincide with what is taught has induced the writer to offer the following remarks as a warning to those who are interested in this work. And with this object in view he has given several illustrations of cases where one could be led astray and lose confidence in what has been taught by good authorities on this subject.

Strength of Iron and Its Machining

It is generally conceded that cast iron having the greatest strength is harder to machine than iron with a low tensile strength. To show how freakish iron is in this respect we submit a record of tests giving the transverse strength of three bars

tested 12 in. between centers, the Brinnell hardness and the analysis:

Bar	Transverse Strength, lb.	Brinnell Hardness	Graphitic Carbon	Combined Carbon	Phosphorus	Manganese	Sulphur	Silicon
1...	3,857	212	2.80	0.69	0.425	0.80	0.096	1.28
2...	4,178	207	2.53	0.91	0.308	0.35	0.083	1.27
3...	3,997	207	2.90	0.93	0.40	0.60	0.083	1.38

This report, if taken seriously, would prove that the strongest iron is not the hardest, but quite the contrary. For instance, bar No. 1 has a transverse strength of 3857 lb. between 12-in. centers (1 in. bar) and a Brinnell hardness of 212, while bar No. 2 has a transverse strength of 3178 lb. and a Brinnell hardness of 207, five points softer and 321 lb. stronger. Bar No. 3 has a transverse strength of 3997 lb. and a Brinnell hardness of 207, five points softer and 140 lb. stronger than Bar No. 1.

The following three bars further prove the same contention:

Bar	Transverse Strength, lb.	Brinnell Hardness	Graphitic Carbon	Combined Carbon	Phosphorus	Manganese	Sulphur	Silicon
4...	4,130	201	2.65	0.82	0.38	0.35	0.082	1.40
5...	2,545	192	2.65	0.81	0.443	0.40	0.098	1.65
6...	3,930	187	3.00	0.91	0.229	0.26	0.097	1.00

Bar No. 4 has a greater strength than bar No. 3 by 133 lb. and is softer by 6 points. Bar No. 5 broke at 3545 lb., with a hardness of 192. Bar No. 6 broke at 3930 lb., with a hardness of 187, making No. 6 five points softer but 395 lb. stronger than No. 5. In this case we have six reliable tests from reliable engineers that demonstrate that the cast iron with the greatest strength is not the hardest to machine.

The analysis has been included in this record because of its value to those interested in determining the real cause for the variation in the strength and hardness.

Explanation of the Variations

Explanations for the results obtained involve the temperature of the metal when the mold was poured, the condition of the mold, the length of time the casting was in cooling and the effects of the different elements in the mixtures. Regardless of the above we believe that it is not possible to increase the strength of cast iron to any great extent without increasing the hardness. While it is possible to secure a very strong casting with a high tensile strength, we must expect to find it a little harder than the weaker iron.

Sulphur and the Hardness of Cast Iron

The writer concedes that sulphur makes cast iron hard, but the following record of six test bars would prove that such is not the case.

Bar No. 1 has a sulphur content of 0.084 per cent and a Brinnell hardness of 217, while bar No. 2 has a sulphur content of 0.095 per cent and a Brinnell hardness of only 207—10 points softer and nearly

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0.01 per cent higher in sulphur. Bar No. 3 had a sulphur content of 0.092 per cent and a Brinnell hardness of 192, while bar No. 4, with a sulphur of 0.097 per cent, has a Brinnell hardness of 187, 5 points softer with the sulphur 0.005 per cent higher. Bar No. 5 has a sulphur content of 0.076 per cent and a Brinnell hardness of 212, while bar No. 6 is

Table of Tests Showing Relation Between Sulphur Content and Hardness

Bar	Transverse Strength, lb.	Brinnell Hardness	Graphitic Carbon	Combined Carbon	Phosphorus	Manganese	Sulphur	Silicon
1...	4,153	217	2.90	0.93	0.504	0.48	0.084	1.50
2...	4,416	207	2.58	0.84	0.334	0.43	0.095	0.86
3...	3,545	192	2.65	0.81	0.443	0.46	0.092	1.65
4...	3,930	187	3.00	0.91	0.224	0.26	0.097	1.00
5...	4,301	212	2.75	0.70	0.49	0.48	0.076	1.29
6...	3,737	189	2.82	0.86	0.338	0.36	0.094	1.32

0.094 per cent in sulphur with a Brinnell hardness of 189. No. 6 is 0.018 per cent higher in sulphur but 23 points softer than No. 5. If these results are analyzed, considering the sulphur only, the decision would be that it does not make iron hard.

This demonstrates that foundrymen must not expect to get results unless they carefully consider every element that goes to make up their mixtures. They should not assume that one thing makes iron soft and use that one thing to accomplish all things. This is sometimes the case. For instance, we have in mind a very competent foundry superintendent whose great hobby was manganese. He found it was very beneficial in his mixtures, so he kept adding it to every mixture in larger and larger portions until he had reached and passed the point where any benefit was derived. When the castings were not good, instead of adjusting this element in the mixture he tried everything else. His experience with it in the beginning had been attended with good results and he would not go back on his old friend. The consequences were it required some one else to pull him out of the rut and the only item that required adjusting was this one element.

Combined Carbon and the Hardness of Iron

As a general proposition combined carbon increases the hardness of cast iron, but with the following tests and analysis picked from a large number made at the same time it may be assumed that combined carbon does not make castings hard:

Bar	Transverse Strength, lb.	Brinnell Hardness	Graphitic Carbon	Combined Carbon	Phosphorus	Manganese	Sulphur	Silicon
1...	4,178	207	2.53	0.91	0.308	0.35	0.083	1.27
2...	4,416	207	2.58	0.84	0.334	0.43	0.095	0.86
3...	4,156	217	2.90	0.93	0.504	0.48	0.084	1.50
4...	4,022	212	2.76	0.98	0.456	0.34	0.084	0.79
5...	3,545	192	2.65	0.81	0.443	0.46	0.094	1.32
6...	3,930	187	3.00	0.91	0.224	0.26	0.097	1.00

Bar No. 1, with a combined carbon of 0.91 per cent, has a Brinnell hardness of 207. Bar No. 2 with only 0.84 per cent combined carbon shows the same Brinnell hardness. Bar No. 3 with a combined carbon of 0.93 per cent has a Brinnell hardness of 217. Bar No. 4 with a combined carbon of 0.98 per cent has a Brinnell hardness of 212. The combined carbon in No. 4 is 0.05 per cent higher and the Brinnell test 5 points lower than No. 3. Bar No. 5 with combined carbon 0.81 per cent and a Brinnell hardness of 192 was harder than No. 6 with a combined carbon of 0.91 per cent which had a hardness of 187—10 per cent higher in combined carbon and 5 points softer.

Addition of Steel and the Strength of Iron

We know that the addition of steel to cast-iron mixtures increases the strength, but for the sake

of argument the following record of 6 tests might show that the addition of steel does not increase the strength of cast iron:

Bar	Percentage of Steel	Transverse Strength, 12-in. Between Centers, Lb.
1.....	40	4,108
2.....	35	4,153
3.....	30	4,301
4.....	20	3,533
5.....	15	3,597
6.....	10	4,022

No. 1 with 40 per cent steel broke at 4108 lb., but No. 2 with 35 per cent steel broke at 4153 lb. There was 5 per cent less steel in No. 2 than in No. 1, but No. 2 was 45 lb. stronger. But No. 3 with only 30 per cent steel had a strength greater than either No. 1 or No. 2, being stronger than No. 2 by 148 lb. No. 4 with 20 per cent steel broke at 3533 lb.; No. 5 with 15 per cent steel broke at 3597 lb., or 64 lb. above No. 4. No. 6 with only 10 per cent steel had a transverse strength of 4022 lb. which is 425 lb. stronger than No. 5 with 5 per cent less steel and 489 lb. stronger than No. 4 with 10 per cent less steel.

This record of tests shows that steel does not increase the strength of cast iron. But the following group proves that it does:

Bar	Percentage of Steel	Transverse Strength, 12-in. Between Centers, Lb.
1.....	55	4,416
2.....	50	4,302
3.....	40	4,158
4.....	40	4,153
5.....	35	4,108
6.....	30	3,997
7.....	30	3,930
8.....	25	3,890
9.....	20	3,777
10.....	15	3,565
11.....	10	3,500

This is a record of 11 heats of almost the same mixture with the exception of the percentage of steel. In the production of semi-steel it is not fair to compare the results with the percentage of steel used alone, because so many other elements enter into the production that have as much and often more influence than the steel itself.

The cupola practice is very important, besides the pig iron used with the steel and its analysis. With a very low silicon pig, providing the sulphur has been taken care of, a lower percentage of steel can be used and as high a strength obtained.

While the writer is not a graduate of the McLain school, he believes that Mr. McLain has handled this subject more thoroughly than any one else in the country, and has demonstrated to many skeptics that semi-steel means more than a certain percentage of steel thrown into a cupola. So, regardless of our record showing that lower percentages of steel give greater strength, steel does very materially increase the strength of cast iron.

As the writer has in his possession a large number of records of tests of various kinds of cast iron, he could continue to pick out a list for every element and with this list prove that what experts say about the influence of each element on cast iron is not true. But the above has been written simply to warn the uninitiated not to jump at conclusions when making tests, but to study every element and the conditions under which the mixture is melted, poured, etc.

Drawing Effective Conclusions

The most effective plan is to take a large number of tests and find the average of groups, these groups to be within a certain limit in the percentage of the element to be studied. For instance, we have found, in working out the effect of silicon, that the average of 20 tests gave a silicon content of 1.42

per cent, a Brinnell hardness of 206 and a transverse of 4040 lb. per sq. in. We found in a group of 20 more tests that the average silicon was 1.50 per cent which gave us a Brinnell hardness of 181 and a strength of 3514 lb. per sq. in. We decided that the silicon softened the iron.

We found in a group of 20 tests that the average manganese was 0.64 per cent, the transverse strength 3481 lb. per sq. in., 12 in. between centers, and the Brinnell hardness 198. In another group of 20 tests we had an average manganese of 0.37 per cent, a transverse strength of 3997 lb. and a Brinnell hardness of 202. We concluded that manganese up to a certain percentage had a tendency to soften the iron.

In a group of 20 tests we had an average phosphorus of 0.617 per cent, a transverse strength of 3595 lb. per sq. in., 12 in. between centers, and a Brinnell hardness of 210. Another group of 20 tests gave an average phosphorus of 0.372 per cent, a transverse strength of 3921 lb. and a Brinnell hardness of 200. We decided that phosphorus had a tendency to increase the hardness.

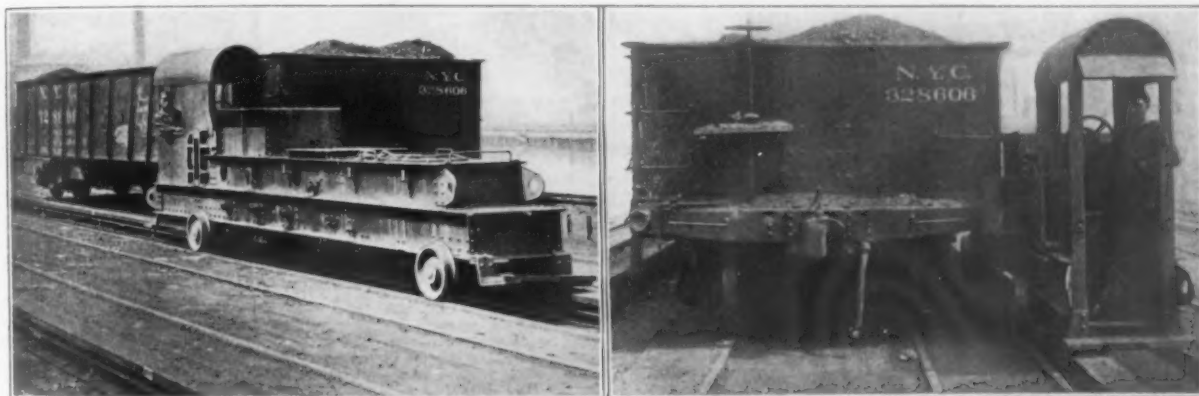
In a group of tests we had an average combined carbon of 0.91 per cent and a transverse strength of 3974 lb. with a Brinnell hardness of 206, while

We have in mind a firm that had trouble with lathe bed castings too open in fracture. When they reduced the silicon and used every other means known to close up the grain of their metal the castings became too hard to machine. The real cause of the open grain was the bottom of their molds, which caused the metal to boil until it solidified. Because a scab did not appear on the castings they did not think it possible that the metal was boiling at this point, but a more careful venting and a little less water in the sand improved the so-called iron trouble.

This is true in many cases of shrink holes. A large riser is put on the mold to overcome a shrink that a little less water and a little more ramming would remedy. For this reason it is important that we know our iron. Then our molding ability will be brought to play where it is needed more quickly.

Car Pusher for Ore-Handling Plants

A new type of car pusher designed for use particularly in connection with ore-handling plants with a view to speeding up the unloading of boats and eliminating the necessity of keeping a switch engine on the docks for shifting ore cars has been brought out



Loaded Ore Cars Are Moved from the Ore Unloading Bridge by a Cable-Operated Pusher, Which Is Arranged to Handle Cars on Either Side

group No. 2 gave us an average combined carbon of 0.635 per cent, a transverse strength of 3448 lb. and a Brinnell hardness of 181, which proved to us that combined carbon increased the hardness of cast iron.

Applying the same method to all tests in a large measure overcomes the danger of being misled by the results of one or two tests. There are so many unusual things laid to the iron in the foundry of to-day that it behooves every foundryman to make a more careful study of them, not so much to be able to improve the product by improving the iron, but rather to be so informed that he will not be blaming the iron, when it is the mold that is doing the damage to the casting.

Defects That Were Not Due to Poor Iron

We at one time lost a great many automobile cylinders, and the verdict was "poor iron." The writer found the iron mixture was correct, and confined his efforts to the mold, the cores, etc. The result was a reduction in loss and better castings from the same iron. This same company purchased from another foundryman a certain casting for its motors because it was then the only foundry which could make an iron that did not develop shrink holes in that casting. We found in a very short time that he was, in reality, the only man who knew that a solid casting could not be made from this pattern without special attention to the cores.

by the Brown Hoisting Machinery Company, Cleveland. Two of these pusher units were placed in use at the Cleveland unloading plant of the Erie Dock Company last season. The ore unloaders span three railroad tracks, and between each set of tracks are located the tracks on which the pushers travel.

The machine has a rigid frame supported on four single flange track wheels operating on a 41½-in. gage track. The pusher is propelled by a single cable which runs between the rails the full length of the dock, a distance of 425 ft. The cable is securely anchored to concrete foundations at both ends through a spring tension device, which keeps it taut. It runs around and is attached to two differential drums mounted on the frame of the car pusher, and, by starting the 40-hp. 220-volt direct-current motor to which they are geared, the machine is propelled along the track. A powerful brake is located on the motor armature. The direction of travel is changed by reversing the motor. Each machine has a drawbar pull of 8000 lb. and a speed of 100 ft. per minute. Power is obtained from two lines of protected conductor bars running between the rails.

The pusher is provided with a broad steel arm located at the front end of the cab, as shown. This arm can be thrust out on either side by a handwheel located in the cab. When in this position it strikes the end sill of the railroad car and pushes it along.

The pusher is 26 ft. in length over all and has a wheelbase of 16½ ft. When operating between railroad tracks laid on 14-ft. centers there is a clearance of 5 in. between the machine and the largest steel hopper cars.

The Electrolytic Pickling of Steel*

Experiments Show a Saving in
Expense and a Greater Efficiency as
Compared with the Chemical Method

BY M. DE KAY THOMPSON AND O. L. MAHLMAN

ALL the iron or steel objects which in the process of manufacture have been heated in the air are covered with fire scale, which is an oxide of iron corresponding to the formula Fe_3O_4 . This has to be removed before the surface can be plated or galvanized. This is usually accomplished by immersing in some acid until the scale is removed by the hydrogen formed by the action of the acid on the iron beneath the scale, which it reaches through the cracks in the scale.

The action which would be expected if a sheet of iron covered with scale were used as cathode in an acid solution is a reduction of the higher oxide to lower oxide. This oxide would be dissolved by the acid. There would also probably be a certain amount of chemical action between the iron under the scale and the acid, as in the purely chemical treatment. It is this action which the electrochemical process attempts to avoid as much as possible.

The electrolytic method has been patented by C. J. Reed, U. S. Patent Nos. 855,667, 827,179 and 827,180 (1907). His specifications, which are followed in this investigation, are: Sulphuric acid of 1.2 specific gravity, at 60 deg. C., current density of 40 to 60 amp. per sq. ft. (4.27 to 6.42 amp. per square decimeter). The anode is lead. The iron sulphate formed is to be removed from the solution from time to time by cooling to 0 deg. C.

The Experimental Details

The method of comparing the two operations consisted in treating two similar mild steel plates covered with equal amounts of scale by the two methods until their appearance showed the pickling was completed. The pickling baths were then concentrated until all solid matter which had dropped off was dissolved, and were

after the pickling. The method given above was adopted because it was thought the results would be more consistent.

The scale was produced by heating for 2 to 8 min. pairs of plates in a muffle furnace, after which they were cooled in air. One of these was then treated by the chemical method, the other by the electrolytic.

The chemical treatment consisted in immersing in a boiling sulphuric acid solution containing about 5 per cent acid until the surface was cleaned of scale. The cell for electrolytic pickling was placed in a thermostat and the iron plate was suspended between two lead anodes. A weighed portion of the concentrated solutions was taken for analysis. The iron was determined by passing the solution through a Jones reductor and titrating with potassium permanganate. Three runs were made as shown in the preceding table.

The appearance of the surfaces of the plates from the two processes was the same. The results are given for comparison as follows:

Experiment	1	2	3
(a) grams iron per sq. cm. in electrolytic pickle	0.0166	0.00678	0.00275
(b) grams iron per sq. cm. in chemical pickle	0.0282	0.0115	0.00395
Ratio of (a) to (b)	0.590	0.590	0.696
Watt hr. used per sq. dm. pickled ..	4.42	1.65	0.184
Watt hr. per g. iron in electrolytic pickle	2.67	2.43	0.667
Cost of power for removing 2000 lb. of iron (as scale and iron)	\$7.44	\$6.76	\$1.86
Value of acid saved for every 2000 lb. of iron removed	25.00	25.00	15.70
Value of saving in iron for every 2000 lb. of iron	55.60	55.60	34.80
(Power was figured at \$20 per horsepower year, acid at 80c. per 100 lb. 60 deg. acid, iron at 4c. per lb.)			

From this it is evident that under these assumptions the saving in iron and acid is far greater than the cost of the power. Part of the iron included in this calculation is the scale itself, as explained above. These experiments should be repeated, determining only the iron in solution and not including the scale which is removed as such during the pickling. The values of practice would then lie between these two values. In these experiments probably more acid is consumed than would be used in practice because in practice not all the scale would be dissolved.

Experiment No. 3 is seen to vary considerably from the other two probably due to accidental differences in the quality of the scale. A larger number of trials would be desirable in order to get a better average value in the saving which could be effected by the electrolytic method.

Reduction of Oxide Iron

In order to see to what extent the oxide Fe_3O_4 is reduced by the current when acting as cathode, some fused magnetite electrodes 3.80 cm. in diameter were used as cathodes in a solution of sulphuric acid of 1.2 sp. gr. inclosed in a porous cup, having a gas-tight cover through which the hydrogen liberated passed to a collecting bottle. It was then transferred to a Hempel burette for measuring. A gas coulometer was connected in series with this cell and the gas was collected in a eudiometer tube. The collection from the two cells was made for equal simultaneous intervals. By comparing the amount of hydrogen liberated in the coulometer (2/3 of the total gas) with that liberated from the cathode compartment, the percent of hydrogen used to reduce the oxide can be computed. The results are given in the table on the next page.

The reduction is most efficient at about 50 deg. C. and with a current density of 50 amp. per sq. ft. The saving in expense which would be effected under the

Table Giving the Results of the Experiments

Data of Experiment No. 1

	Electrolytic	Chemical
Area of plate (sq. cm.)	152	152
Strength of acid	1.2 sp. gr.	4%
Duration of pickling (minutes)	19	23
Temperature	62 deg. C.	100 deg. C.
Current (amperes)	8.5	...
Volts	2.5	...
Total weight pickle liquor (grams) ..	647.3	708.6
Weight analyzed (grams)	32.56	42.61
0.2nKMnO ₄ used (c.c.)	14.28	23.10

Data of Experiment No. 2

	Electrolytic	Chemical
Area of plates (sq. cm.)	823	830
Strength of acid	1.2 sp. gr.	4%
Duration of pickling (minutes)	32	41
Temperature	60 deg. C.	100 deg. C.
Current (amperes)	9.5	...
Volts	2.7	...
Total weight pickle liquor (grams) ..	919	470.3
Weight analyzed (grams)	56.05	35.20
0.2nKMnO ₄ used (c.c.)	30.47	63.85

Data of Experiment No. 3

	Electrolytic	Chemical
Area of plates (sq. cm.)	832	835
Strength of acid	1.2 sp. gr.	5%
Duration of pickling (minutes)	3.75	43.5
Temperature	60 deg. C.	100 deg. C.
Current (amperes)	9.4	...
Volts	2.6	...
Total weight pickle liquor (grams) ..	755	507.7
Weight analyzed (grams)	30.81	30.13
0.2nKMnO ₄ used (c.c.)	8.39	17.65

then analyzed for iron. The amounts of iron dissolved in the two processes formed the basis of comparison.

A comparison that would probably represent more nearly the conditions of practice would be to filter off the solid matter and determine the iron in solution right

*From a paper presented at the thirty-first general meeting of the American Electrochemical Society at Detroit, Mich., May 2 to 5, 1917. The authors are connected with the electrochemical laboratory, Massachusetts Institute of Technology, Cambridge, Mass.

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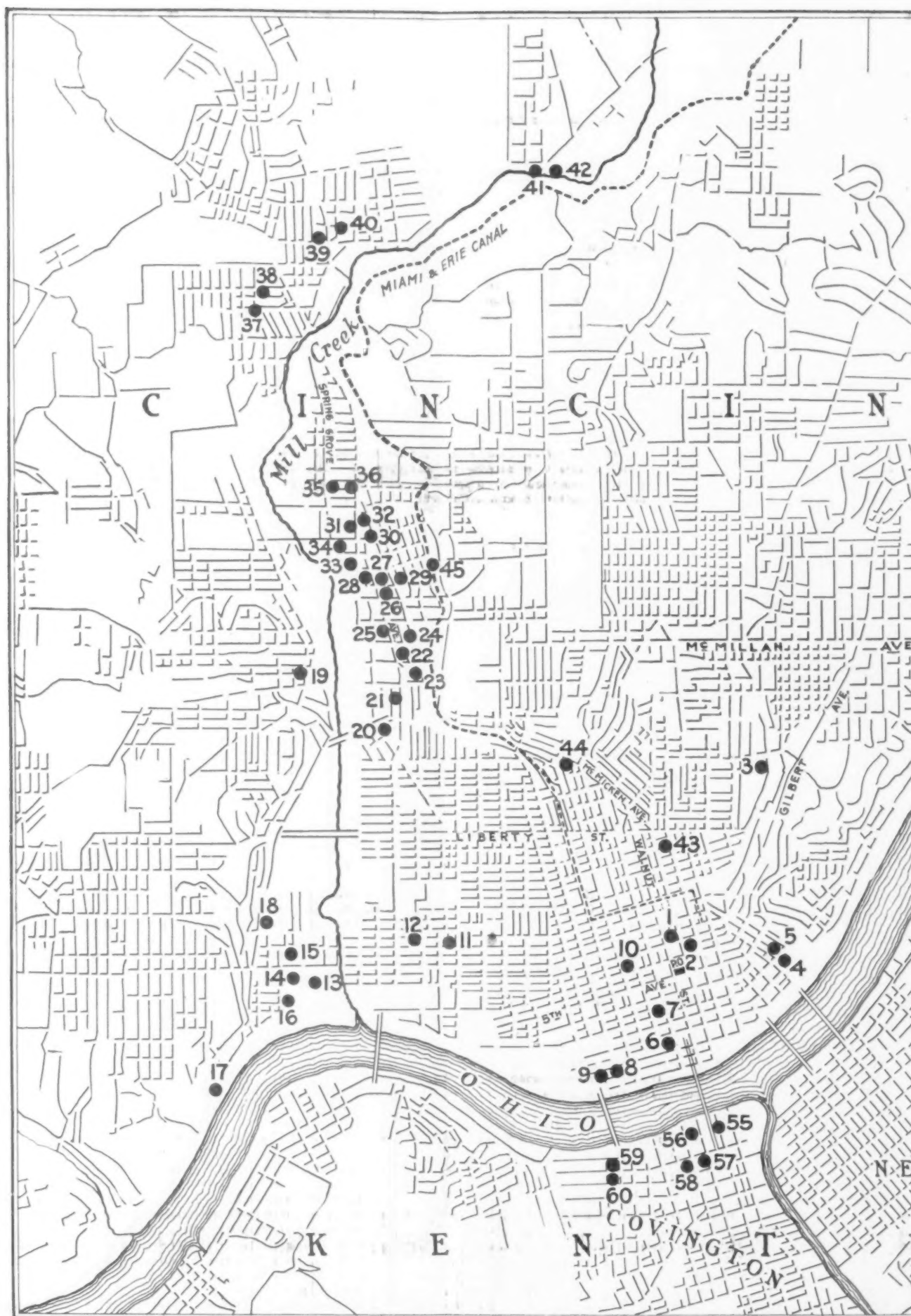
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Machine Tool Building Establishments and Allied Industries



Alphabetical Finding

KEY TO CLASSIFICATION: Reference letter of companies indicate the class of machines and general character of the business as follows:

A, boring mills; B, boilers; C, dies and machine tools carrying stocks; E, electric generators; F, electric grinding and drilling machines; G, engines; H, steam engines; I, jobbing foundries; J, lathes; K, lathes; L, jobbing machine shops; M, machine tools; N, milling machines; O, planing machines; P, punching and shearing machinery; R, pulleys; S, machines; T, shaping machines; U, screw machines; V, sugar machinery; W, auto trucks; X, upright machines; Y, electric welding machines; Z, woodworking.

Acme Machine Tool Co. (K), College Hill or Clarksville
 Alvey-Ferguson Co. (conveying mch.), Oakley
 American Tool Works Co. (KOST), East End
 Averbeck Shaper Co. (T), any Covington car...
 Bickett Machine & Mfg. Co. (K L), 8th St. car...
 Boye & Emmes Machine Tool Co. (K), Clark St. or College Hill
 Bradford Machine Tool Co. (K), Sedamsville or College Hill
 Champion Tool Works (K), Clark St. or College Hill
 Carlton Machine Tool Co. (K), Clark St. or College Hill
 Cincinnati Ball Crank Co. (M), Oakley car...
 Cincinnati Bickford Tool Co. (S X), Oakley car...
 Cincinnati Electrical Tool Co. (F), Sedamsville or College Hill
 Cincinnati Gear Co., Avondale car...
 Cincinnati Gear Cutting Mach. Co., Colerain car...
 Cincinnati Grinder Co. (J), Colerain car...
 Cincinnati Lathe & Tool Co. (K), Oakley car...
 Cincinnati Milling Machine Co. (N), Oakley car...
 Cincinnati Planer Co. (O A), Oakley car...
 Cincinnati Shaper Co. (T), Colerain car...
 Cincinnati Pulley Machinery Co., any Covington
 Cisco Machine Tool Co. (K), Colerain Ave. car...
 Covington Multiple Drill Co. (C), Main & McMicken
 Drees Machine Tool Co. (S), Main & McMicken
 Fay, J. A., & Egan Co. (Z), East End car, East
 Fosdick Machine Tool Co. (S), Colerain or College Hill
 George Automatic Roller Bearing Co., Clark St.
 Gray, G. A., Co. (O), Sedamsville or Warsaw
 Crosstown
 Greaves-Klusman Machine Tool Co. (K), Clark St. or Colerain car...
 Hisey-Wolf Machine Co. (F), Colerain car...
 Hollingsworth Machine Tool Co. (K), any Covington
 Houston, Stanwood & Gamble Co. (B H K), Ludlow
 King Machine Tool Co. (A), Clark St. car...
 LeBlond, R. K., Machine Tool Co. (K N), Oakley
 Lodge & Shipley Machine Tool Co. (K), Colerain
 Lunkenheimer Company (G), any Fairmont car...
 McGowan, John H., Company (pumping machines)
 Morris Machine Tool Co. (K), Sedamsville or Warsaw
 Mueller Machine Tool Co. (S), Colerain car...
 National Lathe Co. (K).....
 Neil-Smith Electric Tool Co. (F).....
 Oakley Machine Tool Co. (J K), Oakley car...
 Oesterlein Machine Co. (N X), Clark St. or College Hill
 Powell, Wm., Co., Clark St. or College Hill car...
 Queen City Machine Tool Co. (T), Main & McMicken
 Rahn-Larmon Company (K), Clark St. or College Hill
 Robinson, J. M., Mfg. Co. (P Q), Clark St. or College Hill
 Sebastian Lathe Co. (K), Ludlow car...
 Sterling Machine Tool Co. (K).....
 Smith & Mills Co. (T), Clark St. or College Hill
 Standard Pulley Co. (R), Colerain car...
 Steptoe, John, Co. (T), Colerain car...
 Standard Electric Tool Co. (F).....
 Thomson Spot Welder Co. (Y), Colerain or College Hill
 Triumph Electric & Ice Machine Co. (E), Oakley
 Tudor Boiler Mfg. Co. (B).....
 U. S. Electrical Tool Co. (F), Sedamsville car...
 U. S. Lathe & Machine Co. (K), Sedamsville or College Hill
 U. S. Machine Tool Co. (N), Sedamsville car...
 Western Machinery Co. (D).....
 Williams, D. T., Valve Co. (G), Clark St. or College Hill

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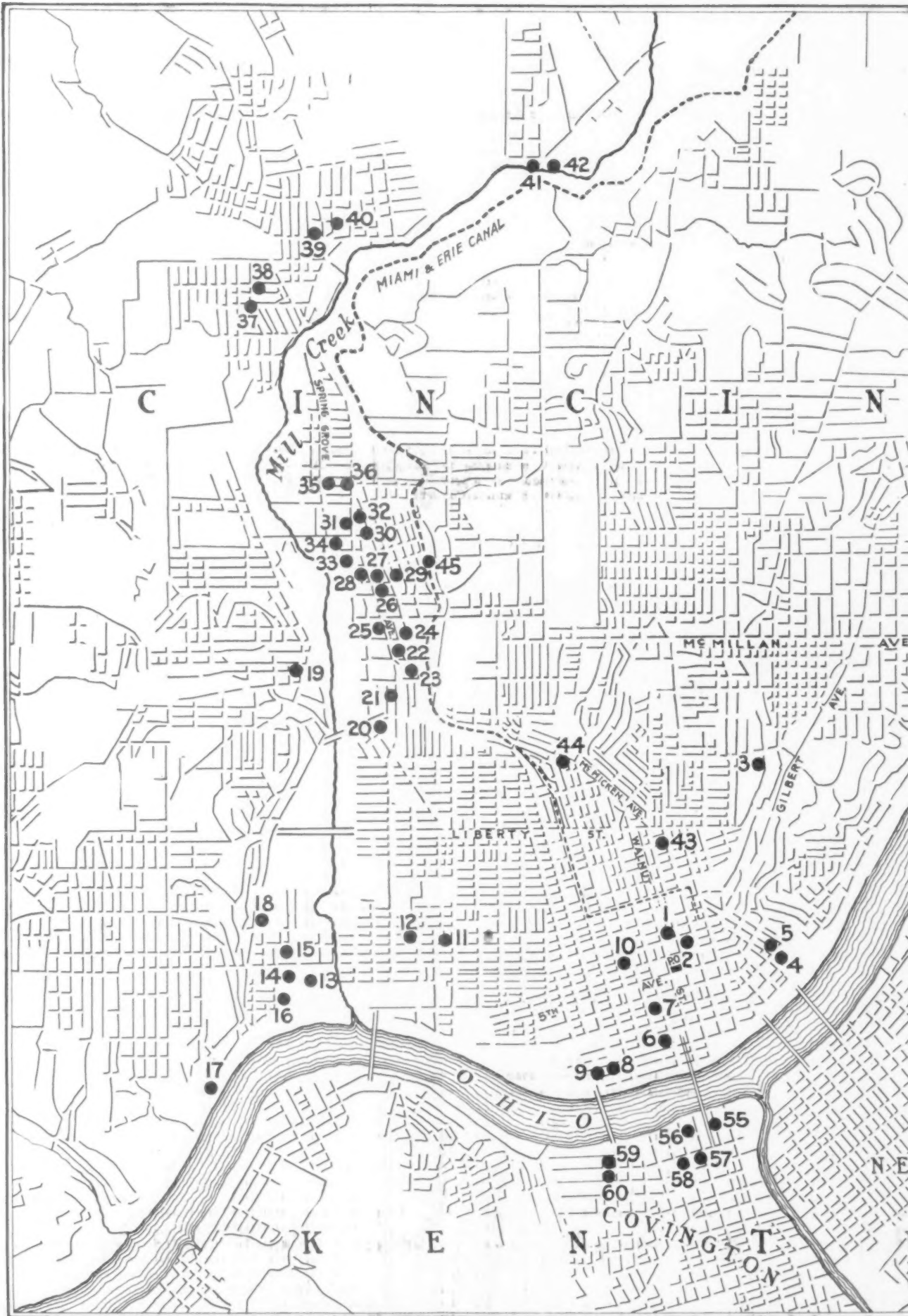
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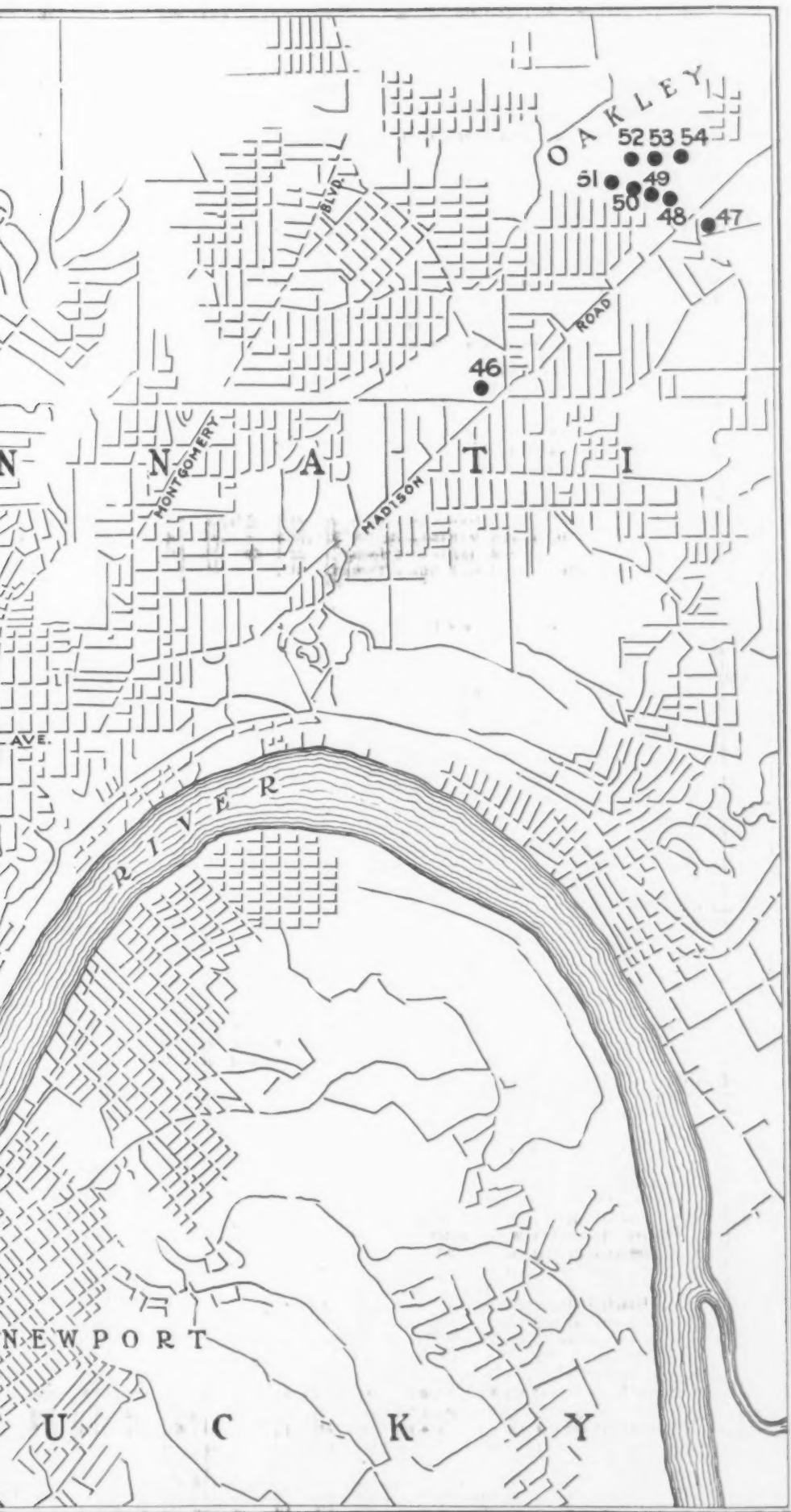
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 Champion Tool Works (K), Clark St. or College Hill
 Carlton Machine Tool Co. (K), Clark St. or College Hill
 Cincinnati Ball Crank Co. (M), Oakley car.
 Cincinnati Bickford Tool Co. (S X), Oakley car.
 Cincinnati Electrical Tool Co. (F), Sedamsville or College Hill
 Cincinnati Gear Co. Avondale car.
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 Cincinnati Grinder Co. (J), Colerain car.
 Cincinnati Lathe & Tool Co. (K), Oakley car.
 Cincinnati Milling Machine Co. (N), Oakley car.
 Cincinnati Planer Co. (O A), Oakley car.
 Cincinnati Shaper Co. (T), Colerain car.
 Cincinnati Pulley Machinery Co., any Covington car.
 Cisco Machine Tool Co. (K), Colerain Ave. car.
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 Fay, J. A., & Egan Co. (Z), East End car, East End
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 Gray, G. A., Co. (O), Sedamsville or Warsaw
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 Hisey-Wolf Machine Co. (F), Colerain car.
 Hollingsworth Machine Tool Co. (K), any Covington car.
 Houston, Stanwood & Gamble Co. (B H K), Ludlow
 King Machine Tool Co. (A), Clark St. car.
 LeBlond, R. K., Machine Tool Co. (K N), Oakley
 Lodge & Shipley Machine Tool Co. (K), Colerain
 Lunkenheimer Company (G), any Fairmont car.
 McGowan, John H., Company (pumping machine)
 Morris Machine Tool Co. (K), Sedamsville or Warsaw
 Mueller Machine Tool Co. (S), Colerain car.
 National Lathe Co. (K)
 Neil-Smith Electric Tool Co. (F)
 Oakley Machine Tool Co. (J K), Oakley car.
 Oesterlein Machine Co. (N X), Clark St. or College Hill
 Powell, Wm., Co., Clark St. or College Hill car.
 Queen City Machine Tool Co. (T), Main & McMicken
 Rahn-Larmon Company (K), Clark St. or College Hill
 Robinson, J. M., Mfg. Co. (P Q), Clark St. or College Hill
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 Standard Pulley Co. (R), Colerain car.
 Steptoe, John, Co. (T), Colerain car.
 Standard Electric Tool Co. (F)
 Thomson Spot Welder Co. (Y), Colerain or College Hill
 Triumph Electric & Ice Machine Co. (E), Oakley
 Tudor Boiler Mfg. Co. (B)
 U. S. Electrical Tool Co. (F), Sedamsville car.
 U. S. Lathe & Machine Co. (K), Sedamsville or College Hill
 U. S. Machine Tool Co. (N), Sedamsville car.
 Western Machinery Co. (D)
 Williams, D. T., Valve Co. (G), Clark St. or College Hill



conditions of these experiments show greatly in favor of the electrochemical method.

The relative efficiency of electrochemical and chemical pickling was determined, and the saving in expense

Table Showing Efficiency in Reduction of Iron Oxide

Current Density, Amp. per Sq. Ft.	Temperature, Deg. C.	Coulometer, Vol. cc.	Volume of Hydrogen, cc.	Efficiency, Per Cent
60	60	142.7	68.4	28.0
60	60	144.4	70.0	27.4
60	60.5	144.5	71.0	26.3
50	60	146.2	62.4	36.0
50	60	146.2	62.4	36.0
50	60	144.0	61.0	36.5
40	60	139.7	61.8	33.5
40	60	140.0	62.0	33.5
30	60	145.4	66.8	31.1
30	60	145.4	68.0	29.9
30	60	145.8	71.0	27.0
15	60	102.7	53.2	22.2
15	60	102.3	53.1	22.1
50	20	121.0	71.8	10.9
50	20	120.2	71.4	11.0
50	30	102.1	46.0	32.4
50	30	101.7	46.4	31.6
50	30	101.0	47.0	30.2
50	40	102.4	34.0	50.2
50	40	101.8	38.8	42.8
50	40	103.0	43.0	37.4
50	50	123.8	48.8	40.9
50	50	123.8	48.8	40.9
50	60	146.2	62.4	36.0
50	60	146.2	62.4	36.0
50	60	144.0	61.0	35.5
50	70	102.8	53.4	22.0
50	70	102.5	53.8	21.2
50	70	103.3	52.2	24.2

which would be effected under the conditions of these experiments, showing greatly in favor of the electrochemical method.

BEARING LUBRICATION

An Investigation of Relation of Film Thickness to Bearing Velocity

A study of the influence of surface velocity on the mean film thickness in the lubrication of bearings forms the subject of the paper which received the student prize of the American Society of Mechanical Engineers in 1917. The paper was prepared by Boynton M. Green, of Leland Stanford, Jr., University.

The apparatus used in the experiments on which the paper was based is shown in Fig. 1. It is non-adjustable and consists of a plain phosphor-bronze sleeve about 3¼ in. in diameter and 7 in. long, pressed into a cast-iron housing which was bolted to a lathe bed. Lubrication was effected by two steel oil-rings of rectangular section. Two sets of oil grooves were cut in the upper half of the bronze as shown in the sketch. On assembling the bronze sleeve and housing it was found that the bronze was elliptical in section, the major axis being vertical. The average difference in diameters was 0.001 in.

While for best results the sleeve should have been reamed after pressing it into the housing the inaccuracy did not seem to affect the results appreciably. The journal was a piece of mild steel ground to a diameter of 3.244 in., giving a running fit allowance of 0.0035 in., or about 0.001 in. per inch of diameter. On each end of the journal a 67-lb. cast-iron flywheel was secured by a nut. The total weight of the assembled journal, flywheels and nuts was 165.5 lb., making a nominal load on the bearing of 7.275 lb. per sq. in. of projected area. The entire apparatus was mounted on two parallel lathe beds, and three lathe heads with four-step pulleys were utilized for the drive. To locate the position of the journal relative to the bearing, three micrometers were used, spaced 120 deg. apart, around the bearing in a plane through its center and perpendicular to its axis.

In determining the mean thickness of oil films the following approximations were made: *a*. The loaded portion of the film was that below the horizontal plane through the center of the bearing. *b*. The thickness of the film at this plane and on each side of the journal was equal to the radial bearing allowance. *c*. The mean thickness of film was the average of the thickness at

this plane and the minimum thickness of the film. The minimum thickness of the film is the radial allowance minus the distance between axes of the journal and bearing.

The curve plotted from the results gave the general equation:

$$y = b + c^a \sqrt{V}$$

in which *y* = mean thickness of film in inches.

b = one-half the radial allowance.

c = constant, dependent on allowance and possibly on viscosity.

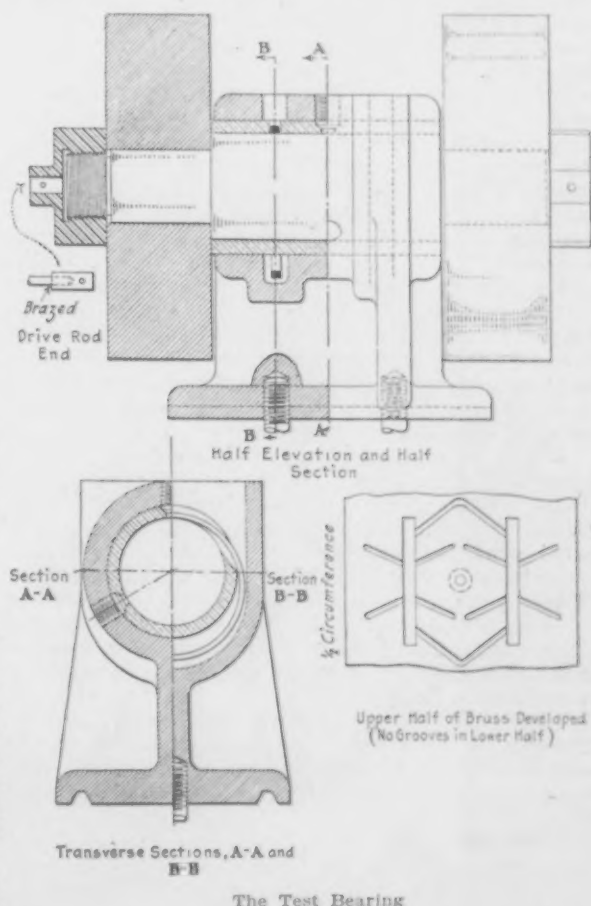
a = constant, dependent on viscosity and possibly on allowance.

V = surface velocity of journal in feet per minute.

From the experimental figures the values of *c* and *a* were found to be: *c* = 0.0000049; *a* = 1.8, and the resulting empirical equation is

$$y = 0.0000049^{1.8} \sqrt{V}$$

As to the application of the empirical equation in the general equation for bearing lubrication it may be said that it may be used directly for conditions of the



same allowance and the lubricants having the same viscosity. For other allowances and lubricants the change of *c* and *a* cannot be stated definitely. In general *c* will change with some function of the allowance and *a* with some function of the viscosity.

The oil used during the experiment was an ordinary mineral oil known as "vacoline," manufactured by the Standard Oil Company. Its viscosity was given by the Engler viscosimeter as 11.0 at 20 deg. C. and 2.95 at 50 deg. C., compared with water at 20 deg. C., which gave a specific viscosity of 38.9 at 20 deg. C. and 8.7 at 50 deg. C.

The Taylor Society, which was to hold a meeting on scientific management in Syracuse, N. Y., on May 18 and 19, has decided to postpone the meeting until a more favorable date. A number of those to take prominent part are so actively engaged in present war preparations that they could not be present and it was thought generally expedient to wait until a more favorable opportunity presented itself.

IMPACT TESTS OF STEEL

The Frémont and Charpy Tests—Static Results Misleading—Careless Heat Treatment

SIR ROBERT HADFIELD, London, England, has contributed an important discussion of Howard J. Stagg's paper on "Impact Tests" before the Steel Treating Research Club of Detroit, abstracted in THE IRON AGE, April 5, 1917, in the shape of a supplementary paper. Mr. Hadfield says in part:

My opinion is that even to-day the value of impact tests is often not fully understood. These tests enable investigations to detect 'fictitiously' tough material in a manner that it is not otherwise possible. As you know, by the use of the ordinary static tensile test data is obtained showing elastic limit, maximum or tensile strength, elongation measured at a certain length and reduction in area.

Static Tests Misleading

It is, however, not generally recognized that these static tests are often quite misleading, at any rate as regards elongation percentage. The engineer usually specifies that he must have a steel or other product possessing a particular tensile strength combined with a minimum percentage of elongation. By following the former he obtains steel products varying from soft to hard according to the figure obtained under such test. As regards the figure obtained from elongation, he believes himself to be in possession of material possessing the necessary ductility. As a matter of fact, it is really nothing of the kind. It is true the figures obtained are in most cases approximately correct, but it is also equally true that they are quite misleading.

The following results, which are taken from my "James Forrest" lecture delivered at the Institution of Civil Engineers some years ago on "Unsolved Problems in Metallurgy," may be quoted. To show the manner in which an ordinary static test may mislead, experiments were carried out as follows:

Mild steel of best quality, containing the following percentage of the elements mentioned: 0.12 carbon, 0.02 silicon, 0.02 sulphur, 0.02 phosphorus, and 0.28 manganese, was obtained. This steel in its properly prepared condition possessed the following mechanical properties: Elastic limit of 16 tons and a tenacity of 28 tons per sq. in., an elongation of 35 per cent, and a reduction in area of 65 per cent. In the treated condition and under the notch or nick test this material bent double cold, as shown by the specimens exhibited at my lecture.

Portions of the same steel were heated to about 1200 deg. C. and allowed to cool slowly. The results were as follows: Elastic limit 9 tons and tenacity 22 tons per sq. in., elongation 46 per cent, reduction in area 64 per cent.

It would naturally be assumed with a rise of 10 per cent in elongation, that is, to the high figure of 46 per cent and the excellent reduction in area of 64 per cent, that the material would be in a still better condition to resist shock than the original specimen, but under the dynamic shock or notch test, remarkable to say, it snapped like cast iron, not even bending 1 deg. Yet a test piece of the same size and from the same material, but not nicked, bent double while cold under shock.

This is a most curious result, and shows how careful users of steel should be in its heat treatment, as without doubt brittleness can be developed under certain conditions at much lower temperatures than the one above mentioned. It is also clearly seen that the existence of the bad qualities, brittleness and low resistance to shock tests, are not shown by the ordinary tensile tests.

Careless Heat Treatment

There is no doubt that careless and improper heat treatment, either originally by the maker or afterward by the user, is largely accountable for most of the so-called mysterious failures of boiler plate or other steel for structural purposes, and yet the existence of the

defects or the peculiar brittle structure are not detected by the usual tensile tests.

It may be stated that the material above mentioned which had been embrittled, after proper heat treatment was entirely restored to a still better condition even as compared with its original unspoiled condition. In other words, the steel was tested as follows:

As received from the rolling mill: This result showed fair average qualities, which would have satisfactorily stood ordinary tests, but under great shock or stress would have failed.

The same material overheated, as often happens in treatment of steel either in the forge or smith's hearth, or otherwise. This material as shown by the tests gave excellent static results, but as the shock tests proved, it was in a dangerous and embrittled condition, to use the words of my friend, Prof. H. M. Howe, one of your great metallurgists.

Exactly the same material as that referred to in the preceding paragraph was taken in its spoiled condition and carefully heat treated. By aid of the scientific advance in the pyrometer and better knowledge of treatment, the material was now quite restored, in fact was in a much superior condition even as compared with the specimen mentioned in the first case.

It is quite possible all the above may be nothing new. On the other hand it occurred to me you might like to have a short statement, specially seeing that as far back as 1905 I carried out the above experiments and placed this knowledge before the world. The world very often does not care for advances and until comparatively recently went on in the old way of appearing to know little and care less as to the best method of heat treating steel, that is why I wish "God Speed" to your club because its very name is an attractive one.

The Best Shock Testing Method

I should like to ask Mr. Stagg, the author of the interesting paper, what shock testing methods he has found best. In my opinion it has been a great pity that the Frémont test has not been used universally, whether in Great Britain, America, or on the Continent. In Germany they have followed more or less the Charpy or French method which is excellent but to my mind has not altogether the same advantage as the Frémont, which depends on a falling weight giving a very sudden and sharp blow. The Charpy pendulum method gives a sudden blow but it is not exactly of the same severe nature as the Frémont. As you know the severer the better for obtaining the highest quality steel.

The Izod method, which is somewhat largely used here, gives variable results and these are shown in foot-pounds. It is a great pity that in all our testing laboratory work we cannot adhere to the metric system. In America you have set an example in trying to decimalize by the use of your one hundred pounds hundred-weight, and the two thousand pounds ton, also by your decimal system of coinage. In laboratories, whether in England or America, we all use the metric methods as regards temperatures, balance work, and so on. Why not for most purposes.

New Steel Foundry in San Francisco

To manufacture steel and malleable castings on the Pacific Coast, the Jewell Steel & Malleable Company of California has been incorporated and the foundry will be located in San Francisco. The total capital stock is put at \$50,000 and the principal holdings are in the hands of W. E. Jewell of the Jewell Steel & Malleable Company, Buffalo, N. Y., and A. Haase, William Lauten and C. S. Maltby, all of San Francisco. Messrs. Haase and Lauten have been operating the Coast Foundry, San Francisco, for some years, having an iron foundry of 500 tons monthly capacity.

A two-fold purpose is served by crane protective panels developed by the Westinghouse Electric & Mfg. Company, East Pittsburgh; injury to the crane motors due to overloads, short circuits, etc., and the premature starting of the motors at times when workmen are inspecting machinery or making repairs.

At the front of the plant is the Administration Building Which Is Connected to the Factory Building by a Bridge. A minimum space of 30 ft. has been provided between units to insure good light and ventilation. The plant is built on a hillside and the contour of the land enables two additional stories to be secured at the rear. The extensions at the side of the front building are utilized for workmen's entrances, stairways, elevator shafts and toilet facilities

Plant of Van Dorn & Dutton Company

Gear Work Arranged for Minimum Handling During Manufacturing—Inspection and Stock Rooms in Center of Each Floor.



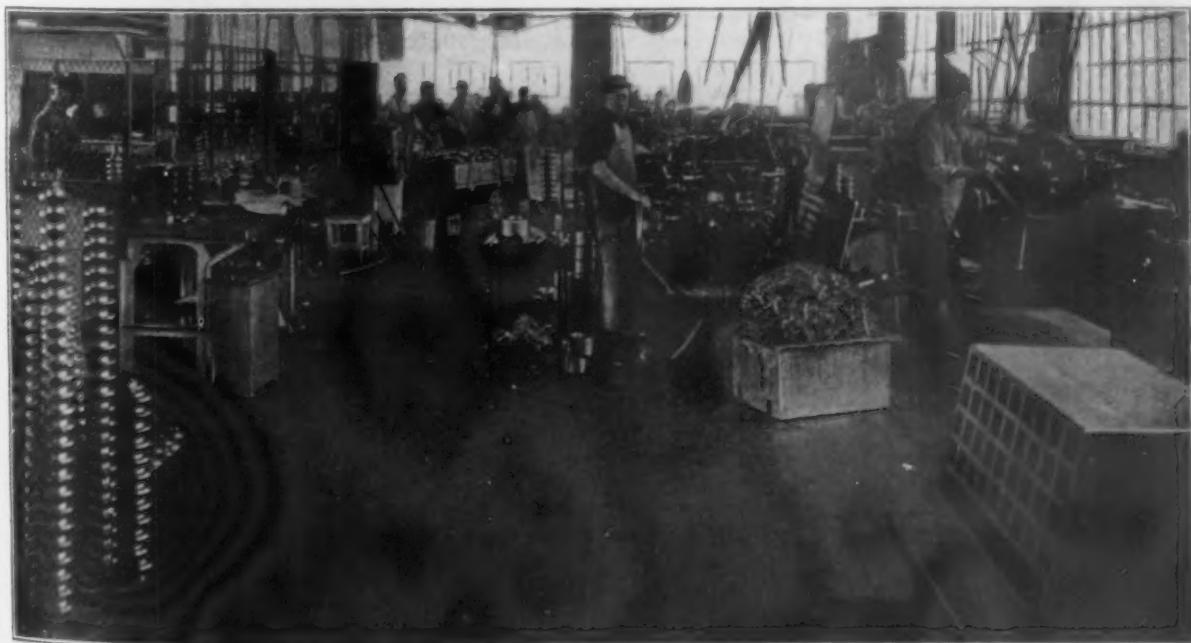
VERY interesting features of modern factory construction and arrangements are found in the new plant of the Van Dorn & Dutton Company, Cleveland. In laying out this plant, very close attention was paid to minor details, with a view of attaining plant efficiency in the highest degree for quantity and systematic production, with as economical operation as possible. A great deal of study was given to the arrangement of the different departments and machinery to make possible the routing of work with the minimum amount of handling and to eliminate as much as possible unproductive labor. The plant and its arrangement have some unique features that were made possible by the topography of the site.

As a gear-making plant it is also interesting because of the great variety of its products, which include spur gears from 1 in. to 8 ft. in diameter and from 20 to 1 diametral pitch and bevel gears to over 60 in. in diameter and from 16 to 1 diametral pitch. This range of products takes in the smallest gears in automobile transmission systems

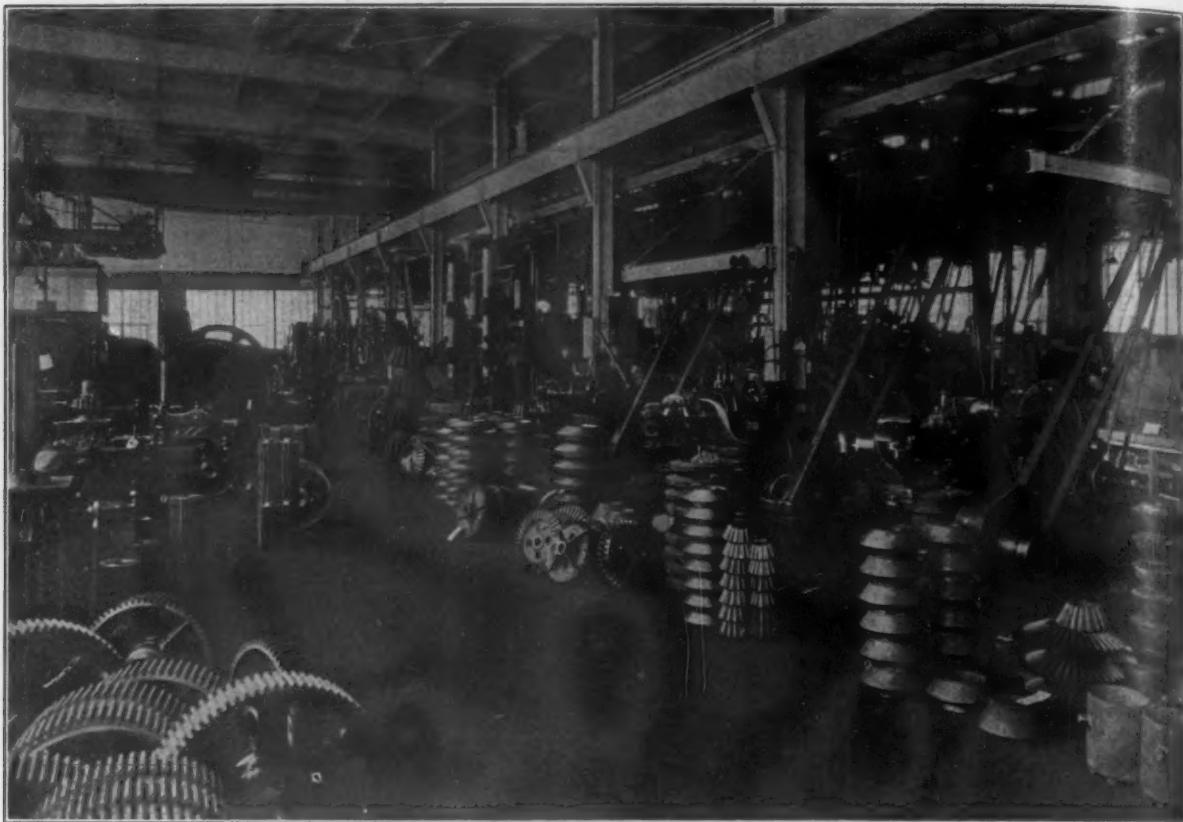
and starting and timing equipment up to the large types used for mill motors. The products also include worm gears.

The plant is located on Woodhill Road, on the East 105th Street crosstown car line, and at the rear is the Cleveland Belt Line Railroad connecting all the steam roads entering the city. A spur track, running alongside the unloading platform in the rear, serves the plant. The site slopes rather sharply from the street, so that the plant is virtually built on a hillside and was laid out to conform to the contour of the land. While the view directly in front shows a two-story building, the rear of the plant is two stories lower down, and the floor of the lowest section at the back is about on a level with the railroad siding at the rear of the building.

At the front is the administration building, which is connected by a bridge to the factory building. In laying out the plant already built and additional units that are expected to be constructed later a minimum space of 30 ft. between units has been



The Turning Department for Automobile and Small Tractor Gears with the Centrally Located Inspection Department at the Left. In the right foreground is a rack with pigeon holes for handling spline shafts, the racks being conveyed about the plant on elevating platform trucks; in the central foreground is one of the buckets employed for collecting the steel turnings and chips, and in the left foreground may be seen one of the small factory trucks used in transporting work from one department to another



The Machines for Making the Larger Sizes of Mill and Motor Gears and Pinions Are Located in Front of the Building Columns, Permitting the Handling of the Blanks and Gears by the Traveling Crane That Spans the Bay, Jib Cranes Being Provided for Handling the Work on Some of the Machines

provided to insure good light and ventilation. The plant is of brick, concrete and steel construction, with an abundance of window space in steel sash, the windows extending the full height of the walls. The floors are designed to carry a load of 400 lb. per sq. ft. The main factory building is constructed in two sections. The front one, 50 x 250 ft., two stories high, is devoted almost entirely to the production of automobile and small tractor gears. This was built 50 ft. wide to obviate the necessity of columns on the second floor. It was found that about as much machine room and working space would be available in a building 50 ft. wide without columns as in a building 60 ft. wide with columns. However, because of the required strength of the floors for carrying machinery on the second floor, building columns are used on the first floor. The roof is supported by a steel truss.

Back of the two-story portion is an addition, 80 x 250 ft., one story in height, the front part of which extends a short distance under the rear of the front section, making the plant three stories high for a short distance at the middle. The greater part of the rear section is used for the manufacture of mill and industrial gears, large and small motor gears and pinions and the heavier type of tractor gears. This building section is high and strongly constructed for the handling of heavy work.

At the front end of the rear section are the receiving and shipping rooms, centrally located with respect to the two gear-making departments and easily accessible from the two floors of the front section above. The slope of the site brings the loading platform, just outside the building at this point, at a proper height for loading trucks on the ground level. Raw stock in the form of drop-forged blanks is taken into the plant at this point. At the rear of this section is a large sub-story room which is used as a general stockroom and is supplemented by sub-stockrooms on each floor. Doors at the back

of this room open on a wide platform that adjoins the switch track. Gears shipped in carload lots are also handled over this platform.

Stairways, elevator shafts and toilet rooms are located in extensions at the side of the building, so that these do not take up any of the working floor space. At the same time their absence from the interior eliminates dark corners, prevents interference with the lighting and gives the plant an appearance of cleanliness.

Bar stock is conveyed from the loading platform in the rear of the plant into the sub-basement storage room by an I-beam trolley hoist, and two other hoists also serve this room. A convenient and economical feature of the plant is the cutting off of the bar stock in this sub-basement so that large bars require only a minimum amount of handling after reaching the plant. The rough drilling of large pinion blanks is also done in the sub-basement. A large opening in the floor above is provided for convenience in conveying stock by crane and trolley from the sub-basement.

The production of automobile and the smaller tractor gears begins in the turning department at the rear of the second floor of the front section. The raw material in the shape of drop forged blanks and others cut from bar stock, usually the former, is brought up from the receiving department directly below and the blanks are turned and bored on batteries of Warner & Swasey, Acme and Jones & Lamson turret lathes, these being used for the multiple production work. Adjoining the turning department is the lathe department, containing batteries of lathes and drilling machines used in jobbing and special turning. At the front of the second floor is the spur gear cutting department, equipped with Brown & Sharpe, Gould & Eberhardt and Newark Gear Company and Lees-Bradner gear cutting machines, and Fellows spur gear shaping machines and rotary cutting machines. The bevel-gear depart-

ment is located at the front of the first floor. Here are produced straight and spiral bevel gears of various types on Gleason and other machines.

The rear section of the plant is devoted to the making of mill and motor gears and pinions from steel castings, forgings and bars. This is divided into two bays. One of these is used for the manufacture of mill and industrial gears of the smaller type, ranging from 6 in. to 2 or 3 ft. in diameter. A monorail system is used on this floor for carrying the gears to and from the machines. In the opposite bay the bigger gears are cut on a battery of large bevel gear shaping machines. This bay is spanned by a 5-ton Alliance crane. The large gear-cutting machines and a 100-in. Niles boring mill, the latter used for turning the outside, boring and facing large gears, are located at the side of the bay so that the large gear blanks can be handled and placed in position on machines with the large crane. Jib cranes are also provided on the building columns back of the machines for use in handling the blanks during the machining operations. The traveling crane is also employed for conveying raw material from the receiving end of the building and the finished product when it is delivered at that end of the plant for carload shipments. After the gears have been cut, those that are to be hardened or heat treated go to the heat-treating department, and then, after cleaning, to the grinding department in the rear of the first floor for finished grinding. Internal, external and universal grinding machines are used, the larger portion of them being of the Brown & Sharpe, Heald, Modern Tool Company, Landis and Bryant make. Most of the product is sand blasted before grinding for the removal of scale produced on the gears during the heat-treating process.

For conveying small gears and pinions around the plant during the various operations, hand trucks with elevating platforms are used. The blanks are

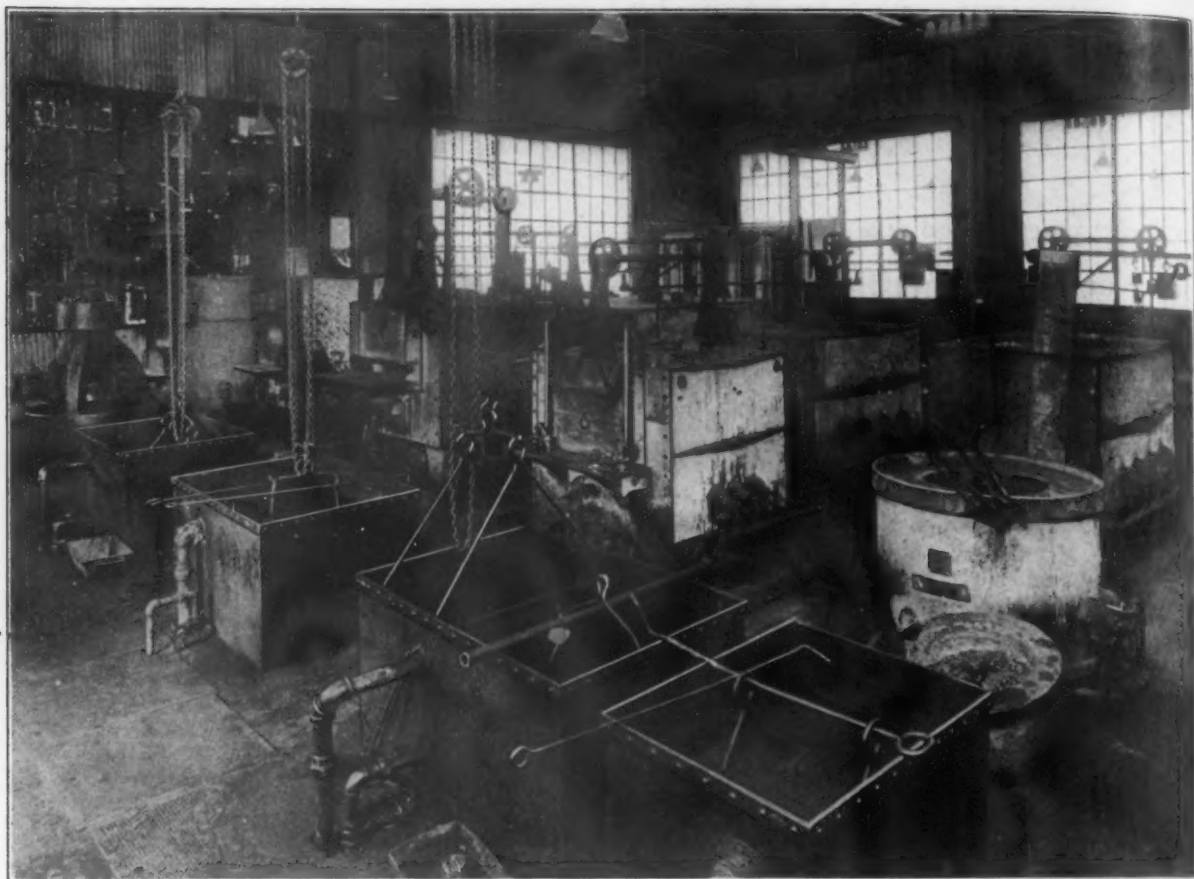
placed on racks specially designed to hold them, some having pigeonholes for spline shafts and others prongs upon which the gear blanks are hung. The racks stand on short legs, so that the trucks can be run beneath them. A rack load of material is set at the side of a machine, the operator returning the blank to the rack when his operation is completed. When the work is finished on all the parts the loaded rack is moved on for the next operation. Owing to the comparatively short hauls, in most cases, hand trucks are used in preference to those operated by storage batteries. A 5-ton electric elevator is employed for handling material between floors.

An interesting feature of the plant designed to save time and labor in moving material in the process of manufacture is the convenient arrangement of the inspection rooms, one of which is located near the middle of each floor. At the sides of the rooms nearly opposite the inspection department are tool cribs and sub-stockrooms, each floor having its own toolroom and sub-stockroom. In these rooms tools, jigs, fixtures and stock are stored on steel shelves. Both the stock and the inspection rooms are inclosed with wire netting instead of having a solid metal inclosure, this arrangement providing better light and ventilation in the small inclosed rooms. All tools, jigs and fixtures are under the supervision of a master mechanic and are checked out under the usual toolroom check system.

The blanks are inspected after each operation to eliminate all pieces that are defective or improperly machined. The inspection and testing equipment includes Brown & Sharpe and Gleason gear testers, plug gages for testing the bore, taper gages for checking the taper and the diameter on gears with a taper bore and micrometer calipers. The gears are tested for correct centers, eccentricity and proper backlash, and a room is being fitted up for testing for noise. After other tests, they are given



A Monorail Track Is Provided Over Each Row of Machines in the Mill and Motor Gear Department for Handling Spur Gears and Blanks



Clusters of Colored Lights Are Suspended Over Each Furnace in the Heat-Treating Department for Signaling the Operators when the Temperature Is Becoming Too High or Too Low

a final scleroscope and Brinell test for hardness. With rigid inspection after each operation it is stated that the final inspection is little more than checking up the previous inspections and that few finished gears have to be rejected. Instead of being a part of the production department, the inspectors are under a chief inspector, who, in turn, is responsible to the engineering department. In this way the question of production is entirely eliminated from the inspection and there is no possibility that small defects will be intentionally overlooked to aid the production department in getting out the work.

The plant is equipped with an electric time clock system and these clocks are conveniently located near the center of the floors where the men stamp their time on cards when starting and finishing operations, thus avoiding the necessity of going to a timekeeper's office. Soda kettles located at convenient points on the floors are provided with tackle blocks suspended from the ceiling, which are found more convenient for handling baskets of material in and out of the kettles than by dipping the baskets directly by hand. The group system of power transmission is used throughout, four or more machines being driven by one motor and eliminating long driving shafts.

The sand-blast room is equipped with two specially designed booths, each accommodating two operators on opposite sides. Each operator has a window through which he can see his work. Electric lamps are provided at each side for lighting the interior of the booth.

A convenient method is being provided for handling chips from the chip boxes on the machines. These will be carried in buckets on trucks and deposited through a door by a trolley hoist on cars that run on an industrial track. On this they will be delivered to the oil-separating building adjoining the rear of the plant and equipped with a

battery of oil separators. Each bucket will be of sufficient capacity to fill the separator. After the oil is removed, the chip container will be raised by a hoist and dumped into a steel bin that adjoins the rear wall of the plant and has a capacity of two carloads. From the bin the chips are dumped by gravity into railroad cars.

The heat-treating department occupies a separate building, 60 x 75 ft., of steel construction. It is equipped with gas-fired Frankfort furnaces, but these are being arranged for the use of fuel oil because of the danger of an inadequate supply of natural gas. The furnaces are located in two rows, back to back, with quenching tanks in front. These are alternately a water and an oil tank. They are 3 ft. wide, 4 ft. long and 5 ft. deep. Gleason hardening machines are also provided for hardening large ring and bevel gears and are used to prevent distortion during quenching. In these machines the gear is held between steel dies made to fit the gear and bolted to an upper and lower plunger. After the gear is inserted between the dies, the plunger is tripped and the gear is carried down into an oil tank formed by the base of the machine. One large car type furnace is provided for heavy gear work and one of similar type will be installed shortly.

The furnaces are equipped with Beighlee pyrometers and a portable instrument is provided for checking the permanent ones. The temperatures of the furnaces are supervised from a control room and an interesting method is used for signalling the furnace operator when the temperature of a furnace should be raised or lowered. The operator in the control room checks the temperature of the furnace, as indicated on the dial before him, with the maximum and minimum temperature for each individual furnace, as shown on a board at his side. A switchboard provided with miniature electric

lights gives him warning when the temperature of any furnace exceeds or falls below the prescribed limits. Above each furnace, as is shown in the illustration of the heat-treating room, is a cluster of electric lamps—one white, two red and two green. When the temperature is getting too high or too low, the operator signals to the first attendant by turning on one or more of the colored lights above the furnace. He does this by a push button on the switchboard.

Air for the furnace is supplied by a Root's positive pressure blower. The oil in the quenching tanks is kept in circulation through cooling pipes by a centrifugal pump.

Usually gear blanks come to the plant properly

annealed and do not require treatment, but, in case they are too hard, they go to the heat-treating department for annealing before the machining operations. The heat-treating and carbonizing operations, after machining, vary materially, depending on whether the gears are of low-carbon or high-carbon and alloy steel, the degree of hardness, depth of case required and the specifications of the consumer.

The general plans of the plant and the system of operation were worked out by the management of the company. The plans were prepared by W. J. Carter, engineer-architect, Cleveland. The buildings were erected by the McClintic-Marshall Company, Pittsburgh.

Opposition to the New Revenue Bill

The Tax on Stock Dividends as Affecting Two Steel Companies—Features of the Bethlehem Increase in Capitalization

WASHINGTON, May 15, 1917.—War revenue legislation has occupied both branches of Congress during the past week, and it is the evident purpose of the leaders to place the new revenue law on the statute books within the next 30 days in the hope of bringing the special session to a close not later than June 20. Experienced observers of Congressional affairs, however, do not look for the passage of the measure at so early a date and believe that Congress will remain in session well into the new fiscal year.

The revenue bill was called up in the House on May 10 and has since been the subject of general debate, with the understanding that it will be discussed by sections after to-day and probably voted upon by Thursday or Friday of this week. Many of its provisions are being sharply attacked by members apart from the committee, on both sides of the chamber.

No Defense of Tariff Features

The House leaders do not attempt to defend the tariff legislation embodied in the bill. In reporting the measure the Ways and Means Committee stated that it was fully realized that "this tax is not scientifically nor equitably adjusted," and that it was recommended only as a war tax. It is an open secret that this provision was added to the bill just before the measure was reported to the House and solely because it was feared the taxing schedules would fall at least two hundred million dollars short of producing the \$1,800,000,000 desired by the Treasury Department. Notwithstanding the wholly illogical and uneconomic method of raising more customs revenue employed in the bill it is believed the House will accept this provision, and in the language of Majority Leader Kitchin "swallow it whole with its eyes shut." Although the time devoted to debating the bill in the House has not been limited, its consideration by that body is regarded as more or less perfunctory, the majority leaders urging the measure under whip and spur and with threats of other more drastic revenue legislation to come, leaving it to the Senate to give to the measure the necessary serious consideration.

Recognizing the glaring defects in the House measure and desirous of obtaining the views of the business men of the country whose interests are affected by its provisions, the Senate Finance Committee began a series of hearings May 11 with the understanding that they will close on Wednesday or Thursday of this week. Owing to the large number of persons desiring to be heard, the representatives of the various interests have been allowed but a few minutes each, although the committee has announced its willingness to receive any briefs that may be filed before the bill is taken up for consideration in executive session.

The features of the measure chiefly criticised in the

hearings have been certain income tax provisions, the taxation of the few industries singled out by the House committee to stand an impost of 5 per cent on their products figured on the manufacturers' price, the proposed 10 per cent increases in customs duties and the drastic changes in the postage rates on second-class mail matter.

Against the Tax on Stock Dividends

The interest of the Finance Committee in certain income tax features of the bill was obviously aroused by Paul D. Cravath who, as attorney for the Bethlehem Steel Company, protested against the taxation of stock dividends as income. Since various corporations have recently distributed stock dividends to represent surplus carried to capital account, without in any way benefiting the stockholders except so far as the corporations themselves have been strengthened, Mr. Cravath's argument will be of very general interest. He said in part:

"I appear on behalf of Mr. Schwab and other stockholders of the Bethlehem Steel Company to discuss the provision of the bill which levies an income tax upon stock dividends. The committee will remember that the provision subjecting stock dividends, so-called, to the income tax, first appears in the amendment of September, 1916. Prior to that time no income tax law in this country, and no income tax law in England, had ever subjected a so-called stock dividend to an income tax. My clients have not asked me to oppose any scheme of fairly distributed taxation, no matter how great the tax may be, and there is no disposition on the part of the gentlemen whom I represent to oppose this proposed tax because of its size, or because of the scale on which it is graduated with reference to increasing incomes.

"The ground of our opposition is that a stock dividend is not a dividend, after all, and that a successful attempt to levy a tax upon a stock dividend would be, in effect, to tax capital; would be, in effect, to select a very narrow class of capital to which this tax would be confined, and we therefore say that such an attempt would result in what I am sure you are very anxious to avoid, unequal taxation.

"Of course, it is important at the outset that we should have a clear conception of what a stock dividend is. A stock dividend really gives the recipient no money, no income that he can spend. It simply gives him something to represent his prior interest in the surplus of the corporation. For instance, if a corporation having a surplus equal to or exceeding 100 per cent of its capital declares a stock dividend of 100 per cent, a stockholder has nothing more than he had before. He simply has two shares of stock to represent what was represented before the dividend by one share of stock. Assuming the profits do not increase, or the

amount of profits distributed does not increase, he gets no greater income. With the same distribution of profits he gets the same income, but the rate per share of stock is cut in half. He is literally no better off than before.

The Bethlehem Steel Company Case

"A few weeks before war was declared, when it was apparent to all that war was inevitable, the Bethlehem Steel Company was confronted with the necessity of strengthening its financial position. It had grown with great rapidity. It had made very large earnings. Its shares, which had a par value of \$100, mounted up to a market value of four or five, or even six hundred dollars at times. But it had but fifteen million dollars of common stock, and that fifteen million dollars of common stock represented, as I remember it, about sixty millions of assets. It had incurred a very heavy debt in this period of prosperity, and its directors said to themselves, 'It behooves us to strengthen ourselves for the coming strain.'

"The situation became more acute by their being required to take, roughly, forty million dollars of obligations of the British Government to pay for munitions, simply because the exchange situation was such that it was then almost impossible for the foreign governments to finance their purchases in this country by the shipment of gold. They therefore had to take about forty millions of British obligations for apparatus in which they were investing their cash, and they were bound to prepare for the enormous additional investment which they would certainly be called upon to make in case this country entered the European war.

"The directors thereupon addressed themselves to the problem of strengthening their financial position. Bankers said: 'If you are to issue notes, or if you are to issue bonds, you must have a broader superstructure. You must have a larger stock issue. The trouble to-day is you have but \$15,000,000 of common stock to represent your \$60,000,000 of assets, and all of that \$60,000,000, excepting \$15,000,000, you could lawfully distribute by way of dividends among your stockholders, and you cannot sell bonds, you cannot sell notes in the amount you require, unless you build a broader superstructure.'

"What did they do? They adopted a plan which first required their stockholders to pay in \$15,000,000 in cash, in return for \$15,000,000 of stock, for which the stockholders paid par, and they distributed among their stockholders a stock dividend of 200 per cent; that is, they gave them \$30,000,000 of stock, which tied up irrevocably in that business \$15,000,000 of this surplus, which, prior to that stock dividend, could have been lawfully distributed by way of dividends. So they were then in a position to say to bankers and to investors: 'The Bethlehem Steel Company now has not \$15,000,000 of capital simply; it has \$60,000,000 of capital stock.' That was the effect and the extent of \$30,000,000 of that stock dividend, and that was the purpose, and the sole purpose, of declaring that stock dividend.

Enormously Increased Taxes

"The leading stockholders were reluctant to consent to that stock dividend. They knew it would be subject to the moderate income tax imposed by the existing law, and they of course were not anxious to pay a tax of 12 or 13 per cent—the large stockholders—for a stock dividend which did not add one dollar to their investment, which did not improve their position one iota, but which simply gave them three pieces of paper to represent what had before been represented by one piece of paper, and which irrevocably tied to that enterprise \$30,000,000 of capital which prior to that declaration of that dividend might have been lawfully distributed in the form of dividends. You see at once what would happen in case this enormous income tax now proposed should apply to such a stock dividend.

"My first objection to the provision of the bill which makes this income tax applicable to stock dividends is its injustice and unfairness, and the comparatively small class of people whom it will reach. Take the case of a man who happened to have 5000 shares of Bethlehem common. He received a dividend of 10,000 shares, and that 10,000 shares would have a

cash value of about a million, two or three hundred thousand dollars. But for easy computation we will say it was worth par. Under the schedule proposed in the House bill, his tax upon that \$1,000,000 stock dividend would be \$400,000, taking par as the value. It would be more if you took market value, but I am adopting an easy computation. So that the corporation, in declaring this stock dividend, without his consent, without consulting him, subjects him to the necessity of paying \$400,000 without having improved his position one bit, and without having added a single dollar to his income.

Lackawanna Steel Company Protest

On behalf of the Lackawanna Steel Company, J. A. Kratz offered an amendment to prevent the double taxation of corporations. He said:

"The Lackawanna Steel Company, like a lot of other corporations, controls through stock ownership several subsidiary corporations. For business reasons, as well as because of the requirements of State laws—forfeitures and penalties to which they are subject—it has never seen fit to consolidate its subsidiary corporations in itself. Under the proposed House bill these subsidiary corporations will pay the income tax, and the Lackawanna Company, which controls through stock ownership the subsidiary corporations, will in turn also have to pay the income tax upon dividends received upon the stock of such subsidiary corporations, which necessarily and naturally results in double taxation.

"This situation could be remedied, as it has been in the excess profits feature of this tax law, by a provision exempting from taxation dividends received from the stock of the corporation which itself has already paid the income tax. The Lackawanna Steel Company is not a holding corporation in any sense, but an operating concern, operating itself and through subsidiary corporations. One of the principal reasons why it has never consolidated its subsidiary corporations is that under State laws its property would be subject to escheat, and for that and other reasons it has kept these subsidiary corporations as entities."

Mr. Kratz suggested the incorporation of an amendment to the effect that "income derived from dividends upon stock of other corporations or partnerships which are subject to the tax imposed by this title shall be exempt from the provisions of this title."

Upon the conclusion of the hearings the Finance Committee will take the measure up in executive session. Chairman Simmons is authority for the statement that the committee will probably devote at least ten days to the reframing of the House bill which will bring the measure into the Senate about May 28. The Senate leaders hope to limit debate in that body to a fortnight, and if this can be done the measure should be passed by the Senate, agreed to in conference and signed by the President by June 20. This program, however, makes no allowances for obstructions or any other delay at any stage of the proceedings. W. L. C.

Standard Roller Bearing Company Reorganized

The reorganization of the Standard Roller Bearing Company, Philadelphia, has been completed. The company intends to enter the manufacturing field on a larger scale, according to plans which have just been outlined by its officials. When the Marlin Arms Company recently took over the plant, financial aid was assured, in the settlement with the creditors, all of whom have been paid and the receivers have been removed. Although the Marlin Company owns the stock of the bearing company, the organization of the latter remains approximately the same with F. M. Germaine as general manager and the company will be operated under its old name. A. N. Goodfellow has been appointed Western sales manager with headquarters at Detroit and will be assisted by representatives at Indianapolis and Chicago. L. M. Watkin will cover the Eastern territory with headquarters at Philadelphia. At the present time a new plant is under consideration, but nothing definite has been decided upon concerning the location.

The Gage Problem in Rifle Manufacture

Not Enough Tool Makers to Equip Private Plants with Fixtures—Why Enfield and Not Springfield Rifles Are Made

WASHINGTON, May 15, 1917.—A very clear statement of the problems now confronting the Ordnance Bureau of the War Department in equipping the American army with small arms, machine guns, ammunition, etc., was presented to the House during the past week by Representative John Q. Tilson of Connecticut. Mr. Tilson is a prominent member of the House Committee on Military Affairs, and has made a special study of ordnance, not only in that capacity but as an officer of long experience in the Connecticut militia. The difficulties now being encountered by the War Department in expeditiously fitting out a large army, because of the delay on the part of the Administration in beginning the work of preparation for war, are described by Mr. Tilson, who emphasizes the apparent impossibility of procuring supplies of gages, dies, special tools, etc., in sufficient quantity to enable the Ordnance Bureau to fit up contractors for maximum production of small arms and ammunition therefor. Readers of THE IRON AGE, and especially those in position to co-operate with the War Department in solving the problems now confronting it, will find this statement of unusual interest.

Two Arsenals Make Rifles

"Modern warfare," said Mr. Tilson, "is a contest of metals more than men. At the time our first militia law was passed, in 1792, it was a different proposition altogether. As firearms have developed, a type of rifle has been adopted, and changed from time to time until now we have what I think is the best rifle in the world, namely, the Springfield service rifle, which is now being manufactured in two of our arsenals—at Springfield, Mass., which is our larger factory, and at Rock Island. We have been manufacturing that rifle, known as the 1903 model, for a number of years. We have gradually accumulated the tools and fixtures in these two arsenals sufficient to manufacture a little over 200,000 a year with a single shift working eight hours a day. If we should speed up to the limit, and run both our factories 24 hours a day with three shifts, we could probably manufacture nearly 500,000 rifles in a year.

"Up to the present time we have accumulated 800,000 of these rifles, including all in the hands of the regular troops, the National Guard, and in reserve. Now, with the capacity limited to 500,000 rifles a year, and with only 800,000 on hand, you see the problem with which we are confronted. If we wish to arm quickly a million men we simply cannot do it with our present capacity. It would be possible and practicable to manufacture these rifles in private plants if we had the gages, jigs, and other necessary tools and fixtures. The gages required are special tools used to determine forms, sizes, limits and dimensions. It requires a large number to make our service rifle, which is composed of something like 150 different parts. A single part of the rifle, known as the receiver, which contains the bolt and the mechanism, alone requires 120 gages for its manufacture. Some of these gages are elaborately constructed tools, and very expensive."

Continuing, Mr. Tilson discussed the wear and waste of small arms under service conditions, stating that this should not exceed 50 per cent per annum. Referring to a report that the Westinghouse Company, in a factory near Philadelphia, had manufactured 1,000,000 rifles for the Russian Government within three

months after the contract had been awarded, Mr. Tilson said this statement was absolutely untrue.

The Russian Rifle Contracts

"Representatives of foreign governments," he said, "came to this country immediately after the war and placed contracts for rifles which they wanted the worst possible way. In Great Britain, for instance, they could not put rifles into the hands of one out of every ten men they could enlist. They came to people in this country who manufactured rifles, and who, as large concerns, had all the money, all the credit, and all the machinery that was necessary, and they placed contracts. What was the result? There was no concern in this country that could produce a single rifle inside of a year, with every possible facility that peace times could furnish them, including money, credit, plenty of skilled mechanics, and everything else. In fact, it was 18 months before any considerable number of rifles on these hurry-up contracts could be delivered. These are facts of my own knowledge. The Westinghouse people are now manufacturing a rifle for Russia. It is what is known as the Russian rifle, and they are being turned out now, as I am informed, at the rate of 2500 a day. I have been informed that the Russian officials have been very stiff in their inspection, and that while the Westinghouse people believed at the outset they could make as many as 5000 rifles a day, the Russian inspectors were confident they could not make over 2500 a day."

Taking up the question of the practicability of re-chambering for United States army ammunition the English service rifle, known as the Enfield, in order to increase the immediate output of serviceable arms for the troops now being recruited, Mr. Tilson said that owing to peculiar manufacturing conditions it is now possible to turn out in this country several times as many Enfields as Springfields. In this connection he said:

Cannot Get Gages Soon Enough

"There is a point that I ought to clear up before leaving it. We cannot now increase our capacity for manufacturing the Springfield rifle sufficiently to serve our purposes because of the difficulty of procuring gages and other special tools. We have waited too long. Special tools and fixtures are required which must be made by skilled mechanics. They are made from designs, and it takes a lot of time to make them. We do not count the money now. We would be willing to pay any amount of money if we had these tools, but we have not got them, and we cannot make them in time to serve our present purpose. If we put all the available toolmakers in the country to work we cannot make them in time to save us in this war, so we must discard that plan. We had a conference of the gage manufacturers of the country assembled here a short time ago. They met over in the House Office Building, and they were asked point blank, 'How many men can you put to making gages?' One man said so many hours a week, and another man so many hours a week, and so on around the room until we got a census of all the gage makers that would be available for Government work. As was told you a while ago, it takes more gages for the rifles than for anything else. It takes a large number—120 for that one piece alone, and about 1400 different ones for the whole rifle. So that it

would take us at least a year—we had just as well face that fact—under the most favorable circumstances, if we should turn all the available toolmakers that we have in the country to making gages for the large scale mass production of that one weapon. We need these toolmakers for something else. We must have artillery ammunition, and we must have gages for that. It takes 253 of these gages to make the time fuse on the end of a shrapnel shell, and it takes 58 gages to make the shell itself that is, that many different ones. We have only about so many men in the country who can do that sort of thing.

Turning to the Enfield Rifle

"The question was, Should we turn them all over to making the gages for the rifle, abandoning everything else? Many of these men are tied up with contracts for making gages for Canada, Russia, and others of our allies. Should we take these toolmakers away from that necessary work and set them to making gages for the rifles? It was decided that it was best not to attempt to do that. Therefore, in view of the fact that we are making in this country a large number of the British rifles, the Enfield, with the gages already in the hands of the manufacturers all over the country, so that we can make at least 15,000 a day, the solution of the problem has been made, and we are to use the Enfield. Necessity has made the solution for us. Instead of going on and attempting to increase our capacity for the manufacture of our own rifle, for the present we shall make the rifle that we can make, and that is the Enfield. The only remaining problem with reference to this matter is what ammunition shall we use? It is not a very serious matter to change the chamber of the new rifles that we make for American ammunition instead of British. If we are going over to France to fight alongside of the British there are a great many advantages in using the same ammunition. They have had great difficulty on the western front in having France armed with one rifle, using one kind of ammunition, Great Britain another, the small Portuguese division another, and the Belgians another. The small contingent of Russians who came over to the Western front were armed, I believe, with the French rifle outright, so they were put in with the French troops, and did not complicate the situation.

"I do not think the Enfield rifle is regarded as the equal of the Springfield rifle for target practice or for open fighting, but the shooting qualities of a rifle are not of such supreme importance in the present kind of warfare. The rifle is not used so much as a shooting arm now in trench warfare. Machine guns are very largely used and finally the bayonet.

Why Not the Springfield?

"The question is asked why we did not provide ourselves with sufficient capacity to make the Springfield rifle. For two years I have urged that we provide private plants with the necessary gages and other devices for making rifles, but there was a general feeling that the needs of the country did not call for it, and we did not do it; and now we are in the position in which we find ourselves. Nothing that I have said or may say is intended as a reflection on any one in any part of the Government, unless it be a reflection on ourselves that we were not farsighted enough to sense the situation earlier.

"Now, as to ammunition, we can make either British or American, and we can produce it in large quantities. The whole question is this: If we are going to fight in France alongside of men armed with the British rifle chambered for British ammunition, whether or not it would be wiser to use the same ammunition; in other words, whether we should chamber the Enfield rifles

that we make here for British ammunition, or whether it would be better to chamber them for our own ammunition, so that we could use not only the Enfield but also the Springfield.

"I have been asked how many Springfield rifles we have manufactured since the beginning of the war, and in reply I would say that while we have increased our total number we certainly have not done so to the capacity of our arsenals. In addition to other types we also have 350,000 Kraggs, but they use different ammunition, and we are not prepared to manufacture them in large quantities. I should consider them out of the question, and do not think we should attempt to make any more of them.

"As to the cost of rifles to-day, there is a tragedy connected therewith. The Springfield rifle, a short time ago, cost us \$14 or \$15, and now we cannot produce it or purchase it for less than \$25.

As to Machine Guns

"Now, turning to the machine gun. I have here six of various types. The first is the old light Hotchkiss gun, which the French call the Benet-Mercier gun. It is an air-cooled gun, of which we have still a number in service. France has a number of them, chambered for her own ammunition, of course, and they are still in use, and a dangerous weapon. Then there is the Colt automatic, of which a great many have been made for use in Russia. It is also an air-cooled gun. It is a good rifle, but it has this objection: that in order to start it you have got to operate a lever first, and then if the cartridge jams you have got to do it all over again. More than that, you must have room where the lever plays, because it goes up and down with each shot. The Marlin people have an improvement on that device, and produce a gun of which they claim to have furnished 15,000 to the Allies during the last year. It has the same lever found in the Colt automatic, but a number of improvements have been added. All of these guns are automatic, and are what are called gas-operated. The Marlin people have another gun in which there is a still further improvement, which obviates the long lever. It works by a piston, and is now being made for the Navy, especially for small boats with which they go out and chase submarines. I understand that the Navy has ordered 1600 of these guns with which to shoot submarine periscopes.

"The Vickers gun is a very excellent weapon for defensive work. It is water-cooled, and does not operate by gas but by the recoil of the gun itself. We have ordered a considerable number of these weapons. The last machine gun I shall refer to is the Lewis gun, concerning which there has been more talk than about any other. It is a gas gun, and is really a very simple machine. It is air-cooled, but on a principle different from that of the other guns. The Lewis gun is manufactured in a number of places. It is being made in large numbers in Great Britain, and was formerly manufactured in Belgium. There is a large factory in this country belonging to the Savage Arms Company turning out the Lewis gun. When the Lewis gun was first brought out, unfortunately, we were not interested in machine guns as we are to-day, in the midst of a great war.

"Turning to the subject of pistols, we have both the old Colt automatic and the new one, our service pistol, which holds 10 cartridges in a magazine and has three magazines, so that it has 30 shots. We are manufacturing them in large quantities, but we cannot do it fast enough to equip all the officers that we are now going to take into the service. Fortunately, we are not so hard up for pistols as we are with respect to some other things. Prices have been badly upset by the increased cost of labor and material. The Colt automatic pistol used to cost about as much as the

rifle, something like \$15, but it costs a good deal more than that to make them now.

Shrapnel and High Explosive Shells

"Now, coming to artillery ammunition, I have here a 3-in. shrapnel containing 252 bullets incased in rosin. There is a black powder charge at the base and a time fuse which can be set to any time up to 21 sec.; hence it is called the 21-sec. time fuse. The fire train is set off by the first concussion when the projectile leaves the mouth of the cannon. That starts the fire train, and then it burns any number of seconds that it is set to burn before exploding. The object of the gunner is to make his shrapnel explode a short distance in front of his target. These bullets then leave the shell and expand in a fan-shaped stream, and go forward making a path of death in front of them. The burning of the rosin and the black powder enable the gunner to see where the shell is exploding, so as to help him locate the next shot.

"For the deep trench work it is necessary to use high explosive shells, which are fired at a high angle, and, coming down, enter the ground, detonating thereafter and blowing up a tremendous crater. These shrapnel and shells are the things of which we have to produce the most, and the problem of producing them is more largely dependent on procuring gages and special tools than anything else. I have here about 30 gages, which are about one-tenth of the number necessary to make the shrapnel time fuse alone. These gages are now being made, especially complete sets of master reference gages. This is very important, and it is essential that we should have a set of master reference gages in the Bureau of Standards by which all the others can be tested.

"In answer to questions concerning the cost of the different machine guns, I would say the price of the Lewis gun is \$750; the Vickers gun is about \$2,700, including a tripod. I am told the Colt gun costs \$650, including a tripod. We bought a lot of Lewis guns last summer, some 300, chambered for British ammunition. I do not know whether we have any Vickers guns or not, but deliveries are to begin this month. It has not been determined how many machine guns it will take to equip an army of half a million men. At present we are using only four machine guns to a regiment of troops. We know that is ridiculously small, and we have got to increase it. General Wood thinks we ought to have one machine gun for every ten men, and we are going to get as many machine guns as we can. As I understand it, we are buying all these different types that we can get that are workable in order to supply our troops, but so far we have an entirely inadequate number."

In conclusion, Mr. Tilson emphasized the necessity of fully equipping any army that might be sent to Europe, stating that the arms and ammunition now on hand would not supply 100,000 men if they were going to fight, although a large force could be fitted out for drilling only. American manufacturers, however, are rapidly getting into shape to produce large quantities of material for the Government, as they are closing up their foreign contracts and will soon have ample facilities for any work. "To turn these private manufacturers that have been manufacturing for the foreigners toward the supplying of our own needs as rapidly as possible," he said, "is what must be done to meet the present situation. This is the answer to the problem."

W. L. C.

The Russian Information Bureau, organized by Prof. B. E. Shatzky, of Petrograd, with the support and assurances of the new Russian Government, in co-operation with the American-Russian Chamber of Commerce, announces the opening of its headquarters in the Woolworth Building.

Book Reviews

Founder's Manual. By David W. Payne. Pages, x + 676, 4½ x 7¼ in.; illustrations, 245. Published by D. Van Nostrand Company, 25 Park Place, New York. Price \$4.

Mr. Payne's book will be welcomed in the foundry trade since it assembles in convenient form for the foundryman's desk information which he desires to have immediately available. Every one connected with the industry, from beginner to executive, will find it useful, as the compiler has brought a broad vision to his task.

The mathematics and reference tables are sufficient and clear. The applied mechanics also will answer all practical needs. The portion devoted to metallurgy is most useful and will be most often referred to, particularly Professor Porter's recommendations for the composition of mixtures, for different classes of castings. Particularly is the influence of the more recently developed metalloids, such as vanadium, titanium, etc., clearly explained.

Cupola practice is not given the treatment that its importance warrants. The comparisons of W. S. McQuillan, published at length in Mr. Stoughton's book, would be a useful addition to this work, as also would H. S. Field's comparative tests of centrifugal and positive blowers. Some description of the centrifugal blower should be made, as this device is proving of value in foundry practice. The foundryman will hardly agree with the compiler that there is little difference between the positive and fan types of blower for cupola service.

The chapter on malleable iron covers the subject well, but causes one to wish for more illustrations of annealing ovens, particularly the coal-fired type of which many more are in use than the gas-fired type illustrated.

Cores, also, are well explained, and here, also, more illustrations would be helpful, especially of small jarring machines now coming into extended use.

Molding machines are treated rather more technically than practically, the reviewer conceiving that the foundryman would like to know more definitely the difference between these appliances and what may be expected of such. The foundryman will read with interest the portion covering molding sand, this commodity having had the benefit of scientific study, to the foundryman's advantage. Accounts are well explained and the examples given are excellent skeletons on which to build.

The size and typography of the book are excellent. It is unfortunate that the cuts are poor. These, we imagine, will be improved in later editions which the compiler will undoubtedly feel encouraged to bring out to include the information which the rapid developing of the foundry business makes available. It is to be hoped, also, that brass-foundry practice will be included in later editions.—G. K. HOOPER.

National Iron and Steel Blue Book. Pages, 588. Size, 6 x 9 in. Publishers, R. L. Polk & Co., 1331 Fifth Avenue, Pittsburgh, Pa. Price, \$10.

This directory of the iron and steel trade is the fifth edition of a book which has proved a valuable work of reference for iron and steel consumers. The edition just issued is confined to the iron and steel trade, while previous volumes included coal-mining companies and producers of coke. The arrangement of the revised work follows the very convenient method adopted for previous issues. Works are arranged alphabetically, according to the names of firms or companies. Those who use the book will find the classified lists of great value. One is an alphabetical index of names of proprietors, directors, officers, managers, purchasing agents, etc. Others are names of iron and steel manufacturers grouped according to their products. Great care has been taken to anticipate the character of the information desired by a reader and to make easy the task of finding it.

The Mitchell-Tappen Company has removed its offices from 50 Broad Street to 15-17 John Street, New York.

Manufacture of Springs for Automobiles

Methods of Testing Semi-Finished and Finished Products Employed at the Plant of the Detroit Steel Products Company

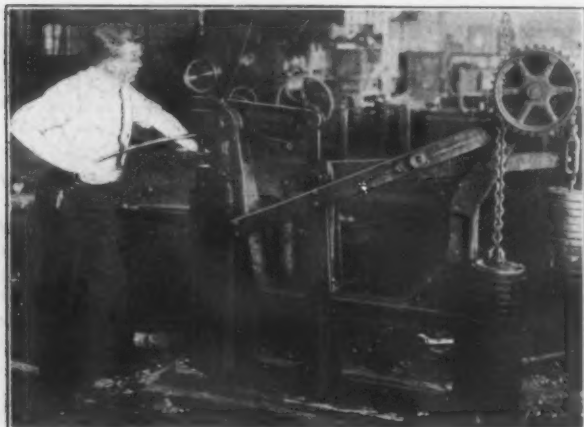
THE foundation of a well-made automobile spring lies in the selection of proper material to meet the particular stress it will have to carry. Other steps in the process of spring manufacture which the Detroit Steel Products Company, Detroit, considers of impor-



The Leaves Which Are to Be Bound Together in a Finished Spring Are Assembled and Subjected to a Flexibility Test

tance are the machining of the different elements to make up a unit that will give the desired deflections upon which much depends and careful heat treatment with subsequent tests as a check to see that the finished product comes up to the specifications.

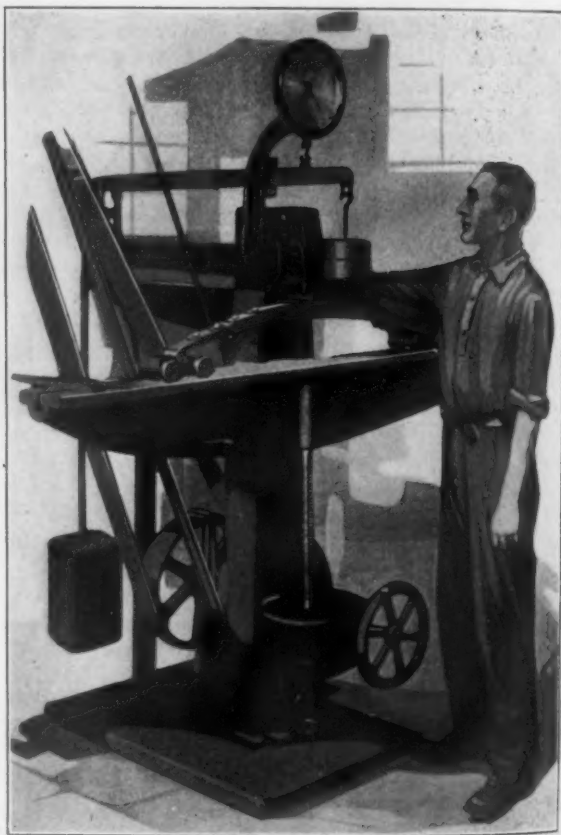
The first step in the process is the machining and shaping of the leaves. In this care must be taken that every leaf shall be of the proper thickness and all should be held securely together at the center after the final fitting of the individual ones. It is emphasized



The Second or Hardness Test Is Made on the Individual Leaves Just Before the Final Assembly and Serves to Check the Heat Treatment

that the eyes in the ends of the spring must be absolutely true and at right angles to the length as otherwise great wear will occur at one part of the eye which will wear out the bushing or the bolt and cause rattle in a short time. Another point is that the width of the eye should be faced to the exact size required, thus preventing knocking caused by play between the shackles and the springs.

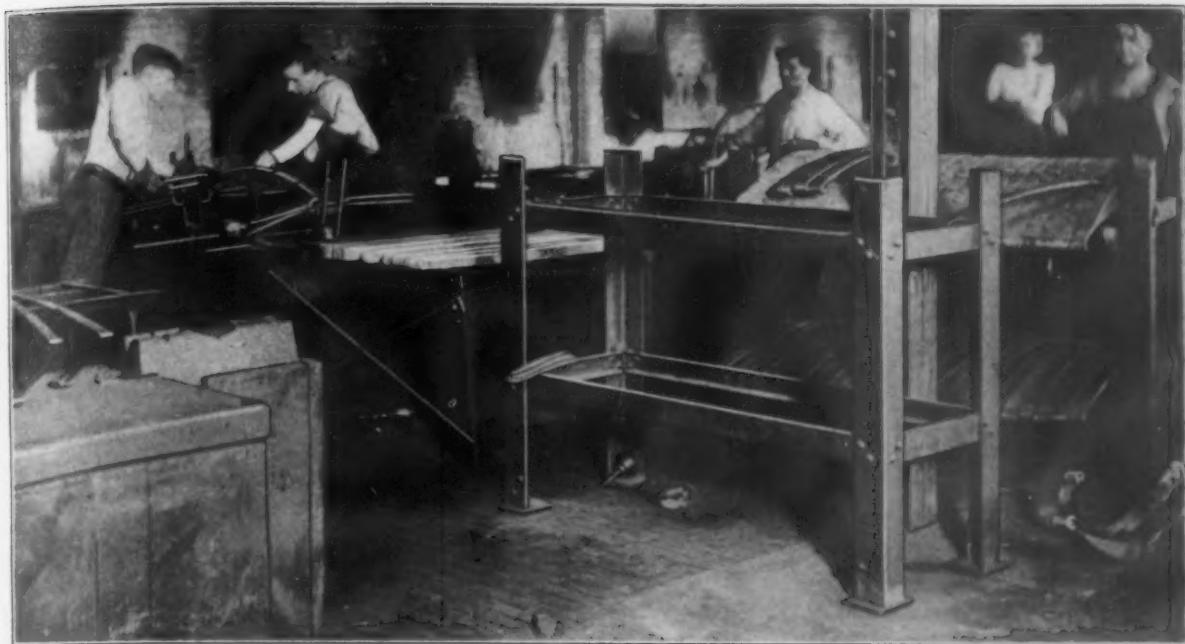
After all the machining and shaping operations are completed, the leaves are heat treated. In the old days, the blacksmith heated a carriage spring to a cherry red and quenched it in a tub of water. As science improved heat treating, methods with electric apparatus to measure temperatures accurately came into use and it was found that one heating and cooling did not give the best results. The spot where the tongs gripped the spring, for instance, always cooled faster than the rest



The Capacity Test Made After the Spring Is Finished Consists of the Application of a Specified Load Without Exceeding a Predetermined Deflection

of the leaf as the tongs carried the heat away. Consequently these spots were harder than the other portions, thus giving a non-uniform texture to the spring. To overcome this what is known as the double-heat method was developed, the spring being heated, formed and quenched and then reheated to a lower temperature and cooled slowly so that the hard spots were reduced. This heating and slow cooling takes the place of the work which the blacksmith used to do and are relied upon to give toughness and durability.

From this furnace the leaves go to the continuous rotary heat-treating furnace, which was illustrated in THE IRON AGE, Sept. 9, 1915. This furnace has the general appearance of a mushroom with the stem cut off and is 26 ft. in diameter. The springs to be treated are placed cold upon the floor which is revolved by an electric motor, a complete revolution being made in from



After the Spring Is Heated, Formed and Quenched, It Is Heated to a Lower Temperature and Allowed to Cool Slowly, Corresponding to the Older Method of the Blacksmith of Heating to Cherry Redness and Quenching in a Tub of Water

20 to 30 min. Seven men are required to operate the furnace which has a capacity of 50,000 lb. of steel per day. This second heating and cooling gives a uniform texture to the spring but leaves it hard and brittle.

From this furnace the springs are taken to the draw furnaces, where a third heating followed by a slow cooling gives the toughness and resilience required. The spring leaves pass through this furnace on an endless chain conveyor, about 25 min. being required for the passage. In this furnace the maximum temperature is approximately 900 deg. Fahr. as compared with 1450 to 1575 deg. in the rotary furnace.

The initial or flexibility test is made by assembling the leaves that are to be finally bound together into the finished spring and subjecting them to a load far in excess of anything they will be called upon to stand in actual service. This test is designed to disclose any defects in elasticity. If a spring passes this test it is stated that it can be depended upon not to settle or break in active service.

A second test is made on the individual leaves when the spring is taken apart for polishing just prior to the final assembly. Each leaf is subjected to a load in a machine which indicates the hardness of the steel and the texture of its grain. This test is employed as a check on the results of the heat treatment.

The final test, which is for capacity, is applied after the spring is finished. As the spring is designed to carry a certain load at a specified height, an indicator on the machine is set at the proper height and the speci-

fied load applied. Should the spring fail to reach the point marked by the indicator it is rejected.

The lubrication problem has been solved by stamping a small saucer-like depression in the end of each leaf while the spring is hot. These depressions are filled with a stiff lubricating paste while the leaves are being assembled, the quantity being sufficient to last from six months to a year according to the amount of service. This paste is automatically spread between the leaves by the action of the springs during the course of travel.

Lincoln Twist Drill Company's Expansion

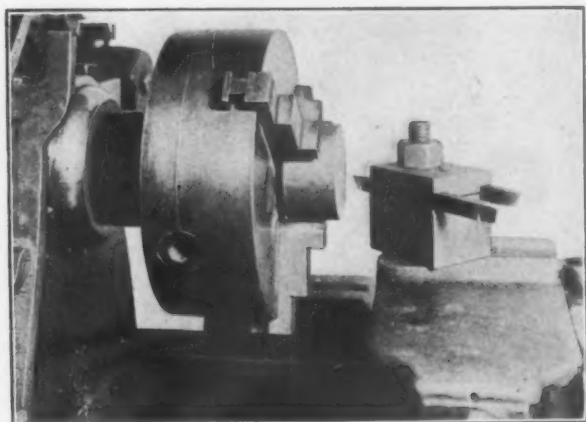
The Lincoln-Williams Twist Drill Company, Taunton, Mass., has been reorganized under the name of the Lincoln Twist Drill Company. Alfred L. Lincoln, formerly president, has retired from the active management but continues as a director of the new organization and has a large stock interest in it. The change in the corporate name has been accompanied by an increase in the capitalization from \$200,000 to \$1,000,000. The officers of the new company are Otis T. Russell, president; Edward Blake, Jr., vice-president and general manager; James H. Ball, treasurer, and Jerome W. Lincoln, clerk. The board of directors consists of Frank O. Wells and Frederick H. Payne, president and vice-president, respectively, of the Greenfield Tap & Die Corporation, Edward Blake, Jr., Alfred L. Lincoln and Clement R. Ford. Mr. Blake will be the active head of the factory at Taunton. He has had a wide experience in the direction of drill and tool making companies, having been connected with the Wells Bros. Company for 10 years and for the past three years general manager of J. T. Slocumb & Co., Providence, makers of calipers and other fine tools. For the last year he has been associated with the Allied Machinery Company, New York.

The Lead Output for 1916

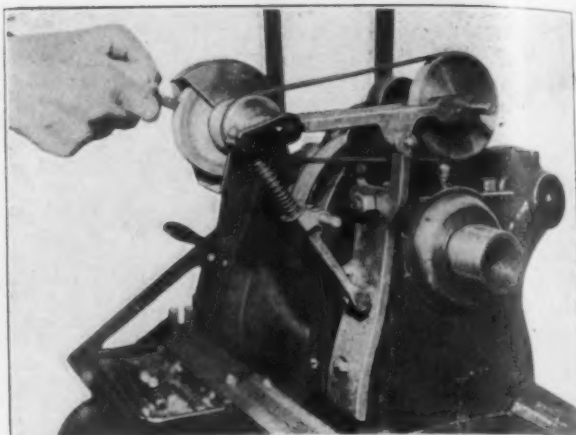
The production of primary refined lead in the United States in 1916, according to a report by C. E. Sieben-thal of the U. S. Geological Survey, was 571,134 net tons, against 550,055 tons in 1915, an increase of 3.8 per cent. This is a record output. The primary lead available for consumption is given as 477,384 tons for 1916, an increase of 12 per cent over that for 1915, which was 426,364 tons. This is also a record. The exports of domestic lead in 1916 were very large, 100,565 tons, against 87,306 tons in 1915 and 58,722 tons in 1916.



The Leaves Are Heated and Cooled Slowly, the Moving Floor of This Draw Furnace Taking a Spring Through in 25 Min.



With This Universal Holder the Change from One Lathe Tool to Another Is Readily Made and It Is Also Possible to Utilize Very Short Pieces of Tool Steel



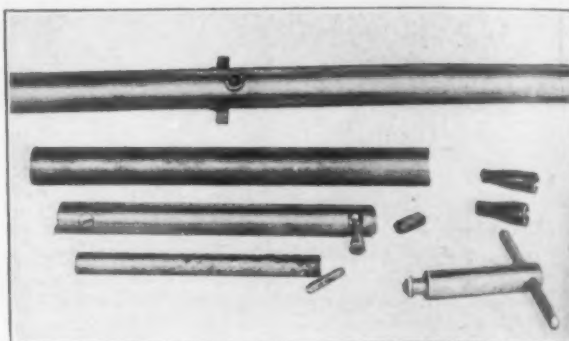
Tools Can Be Sharpened by This Universal Tool Grinding Attachment Without It Being Necessary for the Machinist to Leave His Lathe and Thus Reducing Production

FOUR LATHE ACCESSORIES

Interesting Devices Adding to the Range of Work Handled and Increasing Output

A LINE of lathe accessories has been placed on the market by the Mechanical Development Company, Los Angeles. They are four in number and include a universal tool holder, an extension grinding machine, a boring bar and a universal tool-grinding attachment. All the accessories are designed so that they may be used on the same machine and their employment, either singly or in conjunction with one another, it is pointed out, increases the range of work that can be done in a lathe and also augments the output by rendering it unnecessary to employ other machines for doing the work.

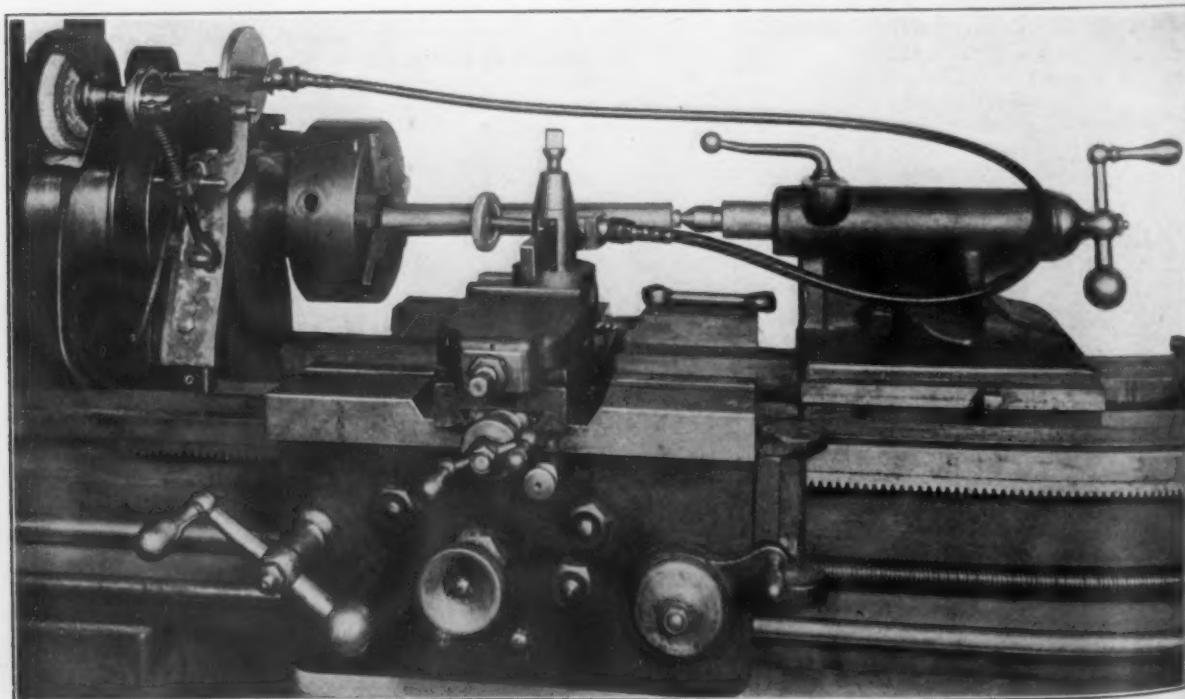
The universal tool holder is capable of being set at any angle, thus giving flexibility. The tool is held in position by a clamping nut which is released by a single turn, thus enabling one tool to be removed and replaced by another quickly. The cutting edge, it is emphasized, is located automatically by the holder, which also saves time as well as doing away with the necessity for employing skilled mechanics on all classes of work. Both cutting-off tools and boring bars up to a maximum diameter of 1 in. are accommodated by the holder, which can also be employed for using short pieces of tool steel.



The Cutting Steel of This Universal Boring Bar Is Held in Place by a Countersunk Screw

The tool grinding attachment furnished is designed for mounting on the headstock of the lathe to eliminate the necessity for the operator to leave his machine and go to a tool-grinding machine located at some central point, and the operator, it is emphasized, can sharpen tools that have become dulled through use and at the same time watch the piece of work mounted in the lathe.

In connection with the tool-grinding attachment, a flexible shaft extension is provided for doing internal boring, truing chuck jaws, etc. The flexible shaft is con-



The Use of a Flexible Shaft Connection Enables the Truing of Chuck Jaws and Other Grinding Operations to Be Performed

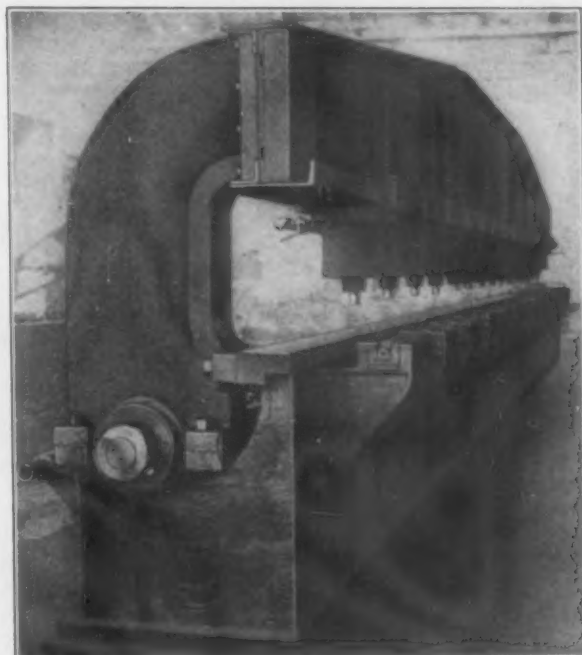
nected to the frame of the tool-grinding attachment and both can be operated at the same time if desired.

The universal boring bar, which completes the line, has as its distinguishing feature the use of a counter-sunk set screw at the end of the bar to hold the cutting steel in place.

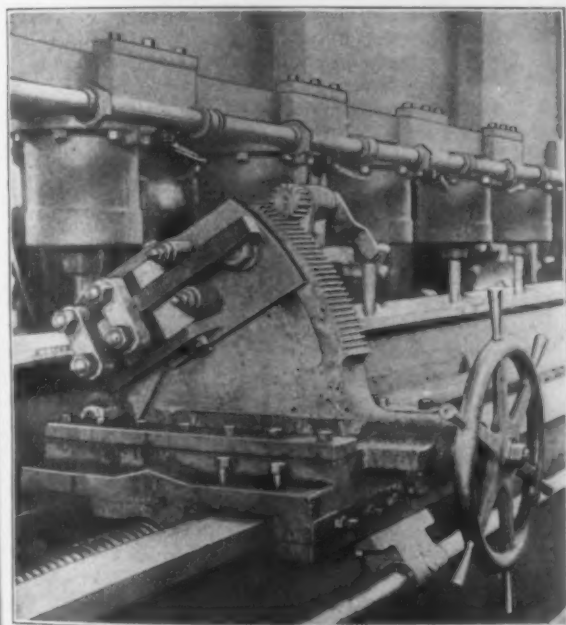
Machine for Planing Edges of Plates

A plate planing machine which can finish 40 ft. of plates at one setting was recently completed by the Covington Machine Company, Covington, Va. It was supplied to the Standard Steel Car Company, Butler, Pa., and is designed for edging plates up to 1½ in. thick and not exceeding 40 ft. long, or packs of plates not exceeding 1½ in. in thickness. The frames of the machine have an open throat so that plates longer than 40 ft. can be handled by moving them forward. It is also possible to accommodate 6 x 6 or 8 x 8 in. angles, and when sections of this type are being edged it is possible to exceed the regular length of 40 ft. by moving the material forward after the first section is cut. The machine embodies a number of new features in its design.

The construction of the machine is heavy and rigid, the weight being approximately 75,000 lb. Power is transmitted to the cutting head by a driving screw, 48 ft. long and 4 9/16 in. in diameter. Two heavy ball bearings, one at each end of the screw, are relied upon to take care of the end thrust due to the tool cutting



Plates Up to 40 Ft. in Length and 1½ In. in Thickness Are Clamped in Position, While the Edges Are Being Planed by 15 5000-Lb. Pressure Pneumatic Jacks



The Cutting Head of the Machine Has Two Swivel Aprons Pivoted on a Large-Diameter Bolt and Capable of a Tool Adjustment of 30 Deg. to Provide a 60-Deg. Bevel Edge

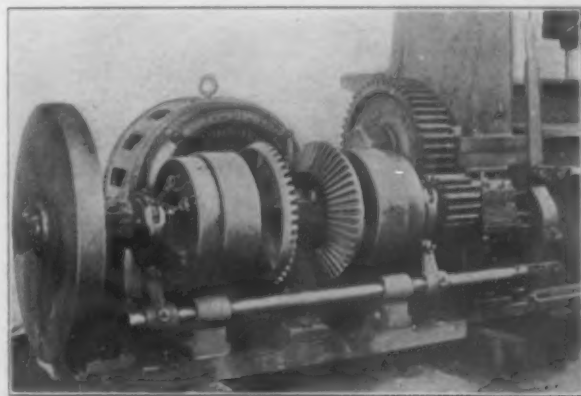
pressure, the arrangement of the screw and thrust bearings being such that the former is always in tension when carrying the cutting load. The screw is supported for approximately the bottom third of its circumference and its entire length. Extended flanges on the support form a trough for flooding the screw with oil, and at each end of this trough is a pocket for collecting the chips that are carried forward by the screw in its movement. These pockets have large drain pipes, thus enabling the oil to be drained and filtered at any time as well as affording an opportunity for washing the screw and trough with kerosene or some other cleansing oil. Any chips that may be thrown out from the screw bearing surface can be removed from the trough by hand or a scraper either when the machine is in use or idle.

The cutting head and the carriage are of heavy rigid construction, and the former rides on large surface ways embodied in the frames. The cutting head, which receives power from the driving screw through a bronze half nut, consists of a steel casting mounted

in the cross feed guides on the carriage with two swivel aprons, one on each side of the cutting head. These aprons are arranged to enable a full cut to be taken at the rate of 20 ft. per min. in either direction, the feed being 1/16 in. The aprons are pivoted upon a large pin bolt which, in conjunction with the clamp bolt at the right edge of the apron, is relied upon to hold the apron for planing the edges of plates at any angle from a right angle to 60 deg. The adjustment for any particular angle is secured by the rack and pinion on the tool head, both aprons moving together. The tool holders are of the conventional clapper box type used on planing machines and are large enough to take a tool measuring 2 x 2½ in. in cross-section and of any standard length.

In operation the side of the plate which is to be edged rests on rollers and a table cast integral with the frame. Pin holes are provided in the table against which the plate is set, and 15 pneumatic jacks, capable of exerting a pressure of 5000 lb. each when air at a pressure of 80 lb. is furnished to them, serve to clamp the plate in position. The cylinders are connected so that all of the jacks can be operated at one time or single ones can be operated separately if desired. A heavy structural steel beam with a channel reinforcement, which is relied upon to guard against lateral vibration and spring, is employed as a mounting for the air cylinders.

The machine is equipped with motor drive, two multiple-plate friction clutches being provided to reverse the direction of rotation of the driving screw. These



Two Multiple-Plate Friction Clutches Control the Engagement of the Bevel Gears with the Motor to Supply Power to the Driving Screw and Reverse Its Direction of Rotation

clutches are arranged to grip two continuously running bevel gears and cause them to mesh with a bevel pinion on the armature of the motor, thus providing the motion in either direction. The motion for reversing the screw through the clutches is taken from the car-

riage, and the flywheel on the end of the clutch shaft is furnished to keep the carriage in motion in the interval after one clutch is thrown out and before the other is engaged. While cuts are being taken the flywheel is also relied upon to maintain a uniform power.

American Rennerfelt Electric Furnace*

Changes in Design and Operation of the Original Swedish Furnace and Their Advantages —Data on Electrode and Power Consumption

BY C. H. VOM BAUR

SOME decided improvements have been made in the design, and consequently the operation, of the American Rennerfelt electric furnace, since my description of this apparatus before the Society at the twenty-ninth meeting in April, 1916, at Washington, D. C. Briefly these consist of the following:

The furnace hearth is now circular, with one set of electrodes, and oval shaped with two sets.

The side electrodes are adjustable in a vertical plane, allowing them to dip toward the bath.

The available power, or instantaneous available heat, has been largely increased.

The operating results obtained in making these three changes have not only kept up the quality of the steel, but the cost has been reduced materially. The reasons for this are quite apparent. With a circular hearth and the flame, in the center, the heat distribu-

whether for partial or full heats, are usually only an inch or so (2.5 cm.) over the bath. As the charge melts, the electrodes are continually lowered, thus keeping the flame about 2½ to 3 in. (6.2 to 7.5 cm.) over the bath. Bringing the flame closer to the bath accomplishes two things: The melted steel more readily absorbs the heat and the large flame, being farther away from the roof, lengthens its life. This is proven by the shorter time to make a heat from a cold charge and by a longer life of the roof.

The possibility of tilting the electrodes up and down helps when slagging off, and lessens the breakage of electrodes. The flame nearer the bath, and with the same potential has a tendency to circulate the slag faster. This can easily be observed, and is of the greatest importance. A more shallow bath facilitates the refining, as the metal comes in contact with this slag on a larger surface.

The flame itself, depending on the size and electric power of the furnace, seems to make a circular patch on the thinned slag directly beneath the flame about 8 or 10 in. (20 to 25 cm.) in diameter, and then mushrooms out. The hotter the furnace, the better the conductivity of the gases and the greater the spreading of the flame. In a two-flame furnace, this flame at times seems to spread over the entire bath. This appearance is, no doubt, due to incandescent gas. The hearth is made more shallow, and thus the rammed-in bottom coming up at the sides makes the sides less steep. This shallow bath shortens the time of melting down, and the lining is less affected at the slag line.

Regulation of the Heat

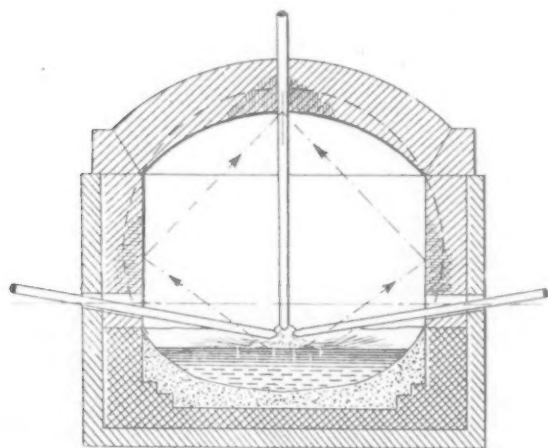
The regulation of the heat applied to the bath is made easier by the variable position of the flame above it, and it also lessens the danger of overheating, which is apt to become so detrimental with an acid bottom. The ease of avoiding overheating is of first importance.

Having the electrode tips never more than 3 in. (7.5 cm.) above the bath has materially reduced the time of melting. Thus far no Rennerfelt furnace in the United States is using fluid charges. With basic bottom the dephosphorizing time has remained unchanged and the desulphurizing period, with the aid of calcium carbide slags, has been reduced. When refining and reducing sulphur with a built-up slag from ferrosilicon and lime, as used in the induction furnace, this was accomplished with good effect.

With furnaces having 300 kw. power per ton of output, heats have been made on basic bottoms, taking off one slag in 2½ hr. with 670 kw.-hr. per ton when operating continuously. With acid bottoms and 200 kw. power per ton of output, taking off one slag, good steel and full heats have come off in 3¼ hr., with 635 kw.-hr. per ton.

Electrode and Power Consumption

The electrode consumption is less than 6 lb. (3 kg.) per ton of steel made, operating continuously. Even with the present excessively high cost of refractories, this cost has been reduced in the smaller furnace of one ton from \$2.91 per ton of steel made to less than 80¢ per ton. Roofs are lasting over 100 heats, and approxi-



The Tilting Electrodes of the American Rennerfelt Electric Furnace

tion is equal at the slag line. There are consequently no cold corners, obviating overheating when melting, so detrimental to both side-walls and roof. The side-walls, slag line and roof, especially the latter, now dome-shaped, are easier to repair. Often, only the center portion of the roof bricks need replacing, the other roof bricks lasting twice as long.

In the illustration, the shaded portions show how the refractories, either basic or acid, wear out first. The portions of the central part of the roof being directly over the flame would naturally wear more there, and it seems that this is accentuated by reflection from a too thick slag first reflecting from the side-walls substantially as indicated by the broken lines. The dotted lines show the tendency toward eventual wear.

The second feature, tipping the side electrodes down from a horizontal position, has several advantages. When smaller charges than normal are made, the most efficient height over the metal when melted can be maintained. During melting, the electrodes at the start,

*From a paper presented at the thirty-first general meeting of the American Electrochemical Society at Detroit, Mich., May 3, 1917. The author is manager of the electric furnace department of Hamilton & Hansell, 17 Battery Place, New York.

mate the longer life made in Europe with better refractories. With a higher power input the heats are shortened, due to the smaller melting period (the heat being considerably reduced during the refining time) thus roofs are lasting more heats than formerly, though the actual time is not much changed. Side-walls of brick outlast two or more roofs, while the bottom lasts a year or two.

The third change, to higher powered furnaces, besides lowering the cost per ton in every way, steadies the consumption of electricity, which has already been very constant. For instance, a 3-ton furnace operating with 600 kw., with hand-regulated electrodes, will reduce in four or five minutes to about 550 kw. without any fluctuation (except during the first part of the melting period) and without touching the electrode regulating mechanism. With smaller furnaces the steadiness is not so marked, whereas with still larger ones, the effect is but little improved. The power factor is about 90 per cent, with 60 cycles. All sudden strains on the power supply are avoided. The arc voltage has been raised, and is now 110 to 120.

In general, too much stress cannot be laid on the various small details, such as tight doors and tight openings around the electrode cooling boxes. With the latter, besides a small clearance between the cooling box and electrodes, asbestos washers help materially.

Regarding non-ferrous metals, the results already published have frequently been duplicated and in some instances bettered. For instance, railroad journal-bearing metal (70 per cent copper, 10 per cent tin, 15 per cent lead, and 5 per cent Zn, Mn, Fe, and impurities) was melted in a hot furnace in 29 min., and with less than 160 kw.-hr. per net ton. Aluminum-nickel alloys were melted in less than 15 min., consuming about 300 kw.-hr. per net ton.

Testing Materials Meeting in June

The American Society for Testing Materials will hold its twentieth annual meeting at Atlantic City, N. J., June 26 to 29 inclusive, with headquarters at the Hotel Traymore. Among the papers announced are the following: "Some Applications of Magnetic Analysis to the Study of Steel Products," by C. W. Burrows, assistant physicist Bureau of Standards, Washington, and "Annealing Temperatures and Grain Growth," by D. J. McAdam, Jr. A topical discussion is announced on the "Role of the Several Alloying Elements in Alloy Steel," to be opened by Dr. Henry M. Howe.

On tests and testing, Mr. McAdam is to present a paper on "Endurance and Impact Tests of Metals," and Prof. H. F. Moore, University of Illinois, is to present a paper on "Rapid Semi-Autographic Tests for Determining the Proportional Limit." On non-ferrous metals the following papers may be mentioned: "The Testing of Sheet Brass," by Charles H. Davis; "Specifications and Inspection for Brass and Bronze," by A. D. Flinn and Ernst Jonson, Board of Water Supply, New York City; "Interior Surface Defects on Brass Condenser Tubes as a Cause of Corrosion," by W. Reuben Webster, general superintendent, Bridgeport Brass Company, and "Effect of Light Versus Heavy Reduction in Cold-Working Brass," also by Mr. Webster.

The reports of committees on steel, cast iron, wrought iron, corrosion of iron and steel, revision of pipe threads, etc., will of course be a feature as usual.

For president next year, Gen. W. H. Bixby, brigadier general of the United States Army, retired, Washington, D. C., has been nominated. For vice-president the nominee is Prof. Edwin Orton, Jr., dean of the College of Engineering, Ohio State University, Columbus, and for members of the executive committee, J. A. Capp, chief of the testing laboratory, General Electric Company, Schenectady, N. Y.; Dr. W. F. M. Goss, University of Illinois, Urbana, Ill.; W. M. Kinney, inspecting engineer, Universal Portland Cement Company, and C. D. Young, engineer of tests, Pennsylvania Railroad, Altoona, Pa.

The total membership on April 20 was 2108, a net increase of 37, as compared with a membership at the time of the last annual meeting.

PIPE PRICES HAVE BEEN HIGHER

To-day's Level Lower Than That of the 1879-80 Boom

The phenomenal rise in prices on finished iron and steel products of all kinds, and on pig iron and semi-finished steel as well, has created the impression that these products at present are at the highest points in the history of the trade. This is true on some lines of finished steel products, but is not the case with pig iron, and in finished products there is an exception in the case of wrought pipe. While present prices on both iron and steel pipe are abnormally high, yet a search into the prices prevailing on iron pipe nearly 40 years ago shows that it was sold at much higher prices than now prevail for steel pipe. On January 28, 1880, the discount on iron pipe, no steel pipe being made at that time, was 40 and 10 per cent off list. This followed the great boom in iron and steel of 1879. However, these high prices of 1880 prevailed only a short time. We give below a comparative statement showing the net prices per foot ruling on iron pipe early in 1880, and also net prices on steel pipe now in effect, following the advance of May 1. It will be noted that while early in 1880 the list price on 6-in. lap weld iron pipe was \$2.75 per ft., the discount of 40 and 10 making the net price \$1.485 per ft., yet the present net price on 6-in. lap weld steel pipe is 96c. per ft. The table below gives list and net prices per foot, on sizes of iron and steel pipe from 1/4 in. to 12 in. in diameter early in 1880 and also net prices on steel pipe in effect at present:

Sizes	List Prices, Iron Pipe, 1880	Net Prices, Iron Pipe, 1880	Net Prices, Steel Pipe, 1917
1/4-in.	\$0.08	\$0.0432	\$0.026
1/2-in. ....	.08	.0432	.0283
3/4-in. ....	.09	.0486	.0283
1-in. ....	.10 1/2	.0567	.0433
1 1/4-in. ....	.12 1/2	.0675	.0618
1 1/2-in. ....	.19	.1026	.0913
2-in. ....	.27	.1458	.1235
2 1/2-in. ....	.33	.1782	.1477
3-in. ....	.46	.2484	.1987
3 1/2-in. ....	.75	.4150	.3141
4-in. ....	.95	.5130	.4108
4 1/2-in.	1.25	.6750	.46
5-in.	1.50	.8100	.545
5 1/2-in.	2.25	1.215	.74
6-in.	2.75	1.485	.96
7-in.	3.75	2.025	1.123
8-in.	4.75	2.565	1.359
9-in.	6.50	3.51	1.628
10-in.	8.00	4.32	1.945
12-in.	12.00	6.48	2.393

Conference on Human Factor in Industrial Preparedness

A national conference on the "Human Factor in Industrial Preparedness" has been called by the Western Efficiency Society to be held in the Auditorium Hotel, Chicago, May 22 to 25 inclusive, and according to the bulletin of that Society a new society will be organized on Saturday, May 26, to be known as the American Society of Industrial Engineers. Topics announced are as follows:

Labor and industrial preparedness; standardization, as a measure of preparedness; the employment problem; educating the workmen—educating the executive; training the coming generation of workers and executives; safety first as a war measure; governmental control as a war measure—and after the war, what?

Besides the meetings with the formal papers and round table discussions, it is planned to include inspection trips to points of interest in industrial Chicago.

It is stated that the proposed American Society of Industrial Engineers is to co-ordinate the work of individual societies and others interested in the welfare of the industrial efficiency movement, co-operating with the Government on the organization of industrial resources.

ESTABLISHED 1855

THE IRON AGE

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Published Every Thursday by the DAVID WILLIAMS CO., 239 West Thirty-ninth Street, New York

W. H. Taylor, *Pres. and Treas.*

Charles G. Phillips, *Vice-Pres.*

Fritz J. Frank, *Secretary*

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BRANCH OFFICES—Chicago: Otis Building. Pittsburgh:
Park Building. Boston: Equitable Building. Philadelphia:
Real Estate Trust Building. Cleveland: Guardian Building.
Cincinnati: Mercantile Library Building.

Subscription Price: United States and Mexico, \$5.00 per year;
single copy, 20 cents; to Canada, \$7.50 per year; to other
foreign countries, \$10.00 per year. Entered at the New York
Post Office as Second-class Mail Matter.

A Tax That Would Cripple

A glaring injustice of the revenue bill reported to the House of Representatives last week is that which increases the postage rates on newspapers and periodicals by three to five times what is now paid. Publishers throughout the country have said with one voice that the proposal of the zone system with the increases it entails is unreasonable, and would amount in many cases to practical confiscation. It was brought out at the hearing at Washington before the Senate Finance Committee on Monday that if these increases go into effect many publications will be compelled to suspend.

The effort to establish the zone system for newspapers, putting them in the same class with miscellaneous merchandise carried by parcel post, was defeated in the last Congress. It is now brought forward as a part of the war revenue program, and with no regard for the merits of the question an effort is made to crowd it through as a war necessity, to be voted for with eyes shut, as the chairman of the committee put it.

Let it be said at once that the publishers of the country are not lifting a finger to escape taxes. Some of them in presenting their case at Washington have said that to whatever amount the Government needed their profits they would yield these up, provided similar imposts were made on other industries; but they were amazed at the unfairness of the effort to raise their costs to an extent that would wipe out profits, coming on top of the great advance in paper cost, from which every publishing office in the country is suffering.

It has been computed that in the case of one publication the cost of mailing under the system proposed would average 4.1 cents per pound. Another publication would be assessed 26 cents per copy on every paper subscribed for in California. The effect thus would be to penalize circulation in the districts more remote from the point of publication, and so far as the spread of intelligence is concerned to cut the country up into districts, with the serious crippling of all papers of national influence. Inevitably sectional lines would be built up, sectional rather than national interests and thinking would be fostered, and the work of the country's leading publications in behalf of national unity in all progress would be set back. The scientific and industrial progress of the nation should

be of the people as a whole, not by zones or sections, and never was the cultivation of unity more demanded than to-day.

In the case of the trade and technical journals, the effect of the new rates under the zone system is a matter of concern, not alone to their publishers, but very directly to every industry they represent. The standing of the business press was never so high as it is to-day. Many such journals have developed so highly their service to trade and industry that they have become to their subscribers a part of the very machinery of their business, as much in every-day use by many of them as the tools of the shop. To the small manufacturer or dealer at points remote from leading trade centers, the business paper carries the latest development in his trade, making it possible for him to keep step with its leaders, and by so doing to contribute materially to the activities of his community.

Thus it has come to pass that the trade papers of national circulation are to-day among the country's chief promoters of business. Their interests are so closely interwoven with the interests of their readers and those who use their pages for sales promotion, that it would be impossible to cripple such a journal without distinctly crippling the trade or industry to which it is linked. The proposed postal rates will cut down the circulation of the business press—in many cases seriously cut it down. That can only mean a curtailment of business—a curtailment that will be felt. So far as it deals with postal rates on publications, the new revenue bill might well be called an act in restraint of trade, if that were not to speak too mildly. It might better be known as an act for the destruction of business.

Prices for Government Steel

Nothing could be susceptible of wider interpretation than the prescription in the law that prices of supplies furnished the Government for war purposes shall be "fair." From the viewpoint of the experiences of various governments, a "fair" price might be interpreted as one not glaringly above what would be charged an individual with ordinary buying acumen. From one viewpoint, a "fair" price might be regarded as a normal price; and that might be a reasonable interpretation if the conditions were normal, but that is not the case.

The current market prices for steel are altogether abnormal, but they are no more abnormal than are the circumstances under which steel is being produced. Price advances have not been confined to steel products. The non-ferrous metals are selling at about double their average price before the war, and finished steel products do not show a much greater increase. Many food products show a larger advance.

The whole philosophy of the conduct of this war, and a most commendable one, is to distribute the burdens equally in all quarters where they can be borne. The selective draft fully recognizes this principle. The graduated income tax falls upon all incomes alike, and is varied in degree in supposed proportion to the ability to pay. In taxing industries on the excess profits plan the same principle is recognized. If all industries were to furnish precisely the same proportion of their output to the Government, an equitable distribution of the contributions to the Government could be made by determining prices on all the commodities furnished according to the same rule. But the various industries are not to contribute equal percentages of their total output, and thus, when a discount is made from prices obtainable in sales to private consumers, an injustice is at once done.

If prices ruling in the steel market are quite abnormal, so also are costs. The last general wage reduction in the steel industries was in 1903. Since the restoration of the former wage rates in 1905 there has been nothing but successive advances. The one early in 1913 was followed eventually by the greatest depression the American steel industry has ever known, in point of intensity, and since the opening of last year there have been four advances, of about 10 per cent each, the last occurring at the beginning of this month. Freight rates have not advanced within the year, but the expenses of the traffic departments have greatly increased, for the present almost normal movement of material is secured only by the most untiring vigilance and the employment of more than normal forces, all involving an increased expense. The integrated companies not only pay much higher wages and expend more money in conducting their transportation, but they also pay fancy prices for many commodities, involving in the aggregate a large item.

The finished steel producers that are not integrated cannot participate in sales to the Government at material concessions without risking serious loss. Comparing present prices with the average of ten years before the war, finished steel products are selling at less than two and one-half prices; but billets are selling at three and one-half prices, pig iron at more than two and one-half prices, Connellsville coke at four prices at least, and coal promises to cost three to five prices. The finished steel producers that are not integrated should be placed in position to participate in the sale of steel to the Government. Undoubtedly they are desirous of doing so, but not on the basis that their contribution, or sacrifice, to the Government shall be greater per ton than that of their larger and richer competitors.

It will not be contended that the Government should pay full current market prices for steel products; for, carried to its logical conclusion, that would place the Government on a level with the de-

tached buyer, the buyer who has no regular mill connection, and who at the present time is likely to go from one sales office to another without securing even a quotation. Placed on a parity with such a friendless being, the Government would have no chance at all. Indeed, the currently quotable market as made in various sales by independent steel manufacturers to more or less regular customers is in nearly every instance materially higher than the prices at which the United States Steel Corporation's subsidiaries last sold to their regular trade, for at the present time the Steel Corporation is almost entirely out of the market. It is a market in which there has been the freest play of the law of supply and demand—a condition which the Government, in its attitude toward all price regulation in the past ten years, has held up as ideal.

The paramount consideration in the changed view of the price situation which has taken hold of the Government's advisers in the past fortnight is that business stability is much more worthwhile than the forcing of extreme price concessions from the industry that must be the nation's main reliance in carrying on the war. The British Government has keyed the British steel trade to a high pitch of prosperity since 1914, and now that it is to join with its original allies and with the United States in making large metal purchases in this country, it may be expected to take no different attitude toward the maintenance of values and prosperous conditions here.

No Time to Be Afraid

Elsewhere in this issue is published a letter from E. F. Miller, a reader of THE IRON AGE at Merchantville, N. J. Commenting on an editorial published in our issue of May 3 in regard to the attitude of the farmer toward the war, Mr. Miller gives some interesting information as to the cost of raising farm products and it is refreshing to hear from a man who believes in applying business principles to the management of the farm. As said in the editorial to which Mr. Miller takes exception, we believe firmly in the patriotism of the vast majority of farmers, but it still seems to us remarkable that men who assume to represent farmers are asking Congress to fix minimum prices for their products at a time when, if there is any proper demand for fixing prices of products, it is to name the maximum.

The principal point, however, to which we called attention was that, as stated by President Thompson of Ohio State University, our farmers are "afraid to sow wheat or plant corn for fear they will not get enough for it, and are really praying that the Lord will limit the crop lest they have a surplus." If such is in truth the attitude of the farmer, he has not yet been fully aroused to the necessity of doing his bit in this time of national crisis. Instead of any farmer being afraid to sow wheat or plant corn, he should glory in the opportunity to do so and be happy to take his chance of being compensated. Mr. Miller does not deny that President Thompson made a truthful statement. We advise him, therefore, to join with President Thompson and all others who are in touch with the farmers to show them that in increasing the production of the farm they will be rendering a highly patriotic

service. The present outlook is that this country will produce barely enough wheat to meet its own requirements. Our Allies in Europe could easily take 200,000,000 bushels. The question is, what are we going to do about it? No one doubts that the mills and furnaces will do their utmost. Will the farmers of the country do less?

Exports of Steel for War

It is well known that a large portion of our iron and steel exports, which as a total have been running at record rate, is for the prosecution of war. Statistics of destination are given as to only a few of the commodities, so that a precise presentation cannot be made. The statistics of exports by items last March and in the nine months ending with March were given in THE IRON AGE last week. It is worth noting that these exports were the largest in any nine consecutive months since the war started, while the exports in the nine months ended March, 1913, were the largest in any consecutive nine months previous to the war. Thus it is somewhat illuminating to observe the percentage of increase or decrease that has occurred, comparing these two periods. Although the total tonnage increased 122 per cent, from 2,310,948 gross tons in the nine months ended March, 1913, to 5,144,743 tons in the nine months ended last March, there have been decreases in some items, running to 57 per cent, while the increases in other items have run to 200 per cent or more. In the following table the items are arranged in order, the largest percentage increase first and the largest percentage decrease last:

Change in Exports, Per Cent, Nine Months Ended March, 1913 and 1917

Billets, ingots, etc.	+585	Rails	+ 42
Horseshoes	+268	Iron sheets and plates. +	33
Steel bars	+212	Steel plates	+ 32
Tin plate	+200	Structural steel	+ 5
Pig iron	+190	Pipe and fittings	0
Scrap	+161	Cut nails	- 11
Barb wire	+150	Steel sheets	- 15
Bar iron	+130	Galvanized sheets	- 28
Wire nails	+121	Radiators and heating	
Wire rods	+ 94	boilers	- 57
Plain wire	+ 85	Total	+122
Railroad spikes	+ 51		

The changes in some of the items would appear more impressive were it not that shipments to neutral and non-producing countries gave way to shipments to the belligerents. Thus our exports of barb wire were formerly chiefly to other parts of America, while lately about half our barb wire has been going to France and Russia. It is easy to see, however, that the items showing decreases, when the total of all items more than doubled, represented commodities hitherto taken by neutral and non-producing countries. Cut nails, for instance, are in favor in South America. The relatively small increases in plates and structural material, when there is such a heavy demand for shipbuilding material, simply brings out the fact that a large demand from neutrals has been suppressed. The extreme scarcity of plates at this time is not due to the fact that the increase in demand is so very great, but rather to the fact that plate-rolling capacity is not flexible. With all the pressure that is exerted for plates, the plate output is only about 15 per cent of the total

finished steel output, simply because the plate mills cannot roll a larger tonnage.

It must be remembered that our exports of iron and steel do not represent overseas trade exclusively by any means. Fairly complete statements of exports by destination are given in the case of about two-thirds the tonnage exported, and from these data it can be estimated that about one-fifth of our iron and steel exports in the nine months ended last March went to Canada, Mexico and Cuba. Canada and Cuba have drawn upon us much more of late than they did formerly.

President Grace on Munitions Capacity

At the dinner of the Wilmington, Del., Chamber of Commerce, May 11, President E. G. Grace of the Bethlehem Steel Company was one of the speakers. He said in part:

"At the beginning of the war in Europe the shell making capacity of the whole United States was practically negligible. At the present time the Bethlehem Steel Company has capacity for 1,000,000 rounds of ammunition per month. At the beginning of the war, facilities for the making of field guns in this country were insignificant. At that time the entire English army had only about 600 field guns. At the present time our works at Bethlehem are turning out 100 finished steel guns per month, as well as over 2000 gun forgings which can be completed elsewhere. . . .

"With proper co-operation between the Government and the various shipbuilding companies, with provision made for an adequate supply of raw material, it will be possible for this country rapidly to construct an amazing tonnage of new ships. Perhaps they will not be the most perfect ships, but they will 'do the trick,' and make it certain that our Allies shall not want for adequate assistance or the means of subsistence.

"Shipyards can be established at every deep waterway point in the country where materials and labor can be quickly assembled. We ought to build all the wooden ships we can possibly make, but we need also to build a very large number of steel ships. We of the Bethlehem Company are prepared to co-operate with our Government to the utmost in building the necessary tonnage of ships."

Steel Corporation's Largest Order Book

For the first time the unfilled orders of the United States Steel Corporation exceeded 12,000,000 tons with the report for April 30, 1917. On that date the unfilled orders were 12,183,083 tons, an increase of 471,439 tons over those for March 31, which were 11,711,644 tons. As compared with those for April 30, 1916, the increase in one year is nearly three times. The following table gives the unfilled tonnage at the end of each month from January, 1914:

	1917	1916	1915	1914
January	11,474,054	7,922,767	4,248,571	4,612,640
February	11,576,697	8,568,966	4,345,371	5,026,440
March	11,711,644	9,331,001	4,255,749	4,652,826
April	12,183,083	9,829,551	4,162,244	4,577,068
May		9,937,798	4,264,598	3,998,160
June		9,640,458	4,678,196	4,032,557
July		9,593,592	4,928,540	4,158,589
August		9,660,357	4,908,445	4,213,321
September		9,522,584	5,317,618	2,787,607
October		10,015,260	6,165,452	3,461,897
November		11,058,542	7,189,489	3,324,582
December		11,547,286	7,806,220	3,336,644

A commentary on the difficulty of shipping the products of steel mills is indicated in the recent laconic reply to the president of a railroad when he asked when he would get his rails. A photograph was taken of a large pile of rails in the mill awaiting transportation facilities with the name of the road on a sign board surmounting the pile, and the picture was sent to the railroad president with the invitation to "Come and get them."

CORRESPONDENCE

The Farmer and the War

To the Editor: In the May 3 issue of THE IRON AGE there is a short editorial reflecting on the attitude of the farmer toward the production of food during the war, which betrays either ignorance of the farmer's conditions or a willingness to place on them burdens which should properly be borne by the remainder of the population. When it comes to limiting prices, why not begin with rolled plates, shapes, copper and soft coal?

The price of wheat is to-day, say, from \$2.75 to \$3 per bushel, as compared with the cost of about \$1.50 per bushel to produce. Wheat has never cost less than 90c. per bushel to raise on land cleared, fenced, provided with the proper buildings and usual improvements. Corn is to-day selling for approximately \$1.70, costing to raise near 70c. It has never cost less than 35c. per bushel to raise. Milk is to-day selling at less than the cost of production. No dairyman can afford to sell milk at less than 7c. per quart at the farm. To-day he is obtaining from 4½ to 6c. for his milk.

Steel plates are to-day selling at approximately 7c. per lb. as compared with a price of 1.25c. to 1.45c. about three years ago. Where the producing company owns its own ore and coal lands and furnaces the cost of these plates to-day is not more than 2½c. per lb., probably somewhat less, near 1.75c. Copper has sold from 30c. to 37c. per lb. within some months. According to the published reports of the copper companies the cost has been running from 7½c. to 11 and a fraction per pound. It is my impression that the cost has not been published by the companies who have been producing copper the cheapest, which I have some reason to think is not over 7c. per lb. The soft coal miners are to-day loading coal on cars at from \$3 to \$3.50 per ton, which has not cost them more than \$1 per ton to get out.

The farming population is working to-day from 10 to 14 hr. per day and is in no mood to sacrifice, and to work for less than cost to accommodate the demands of people who are working 8 hr. or less per day.

I venture the statement that among the owners of THE IRON AGE, or their friends, you will not be able to locate one person owning a farm on which he does not live who can show a balance sheet which would be passed by a firm of certified public accountants, as exhibiting a profit such as any enterprise must show when making the effort to sell preferred stock or bonds.

The patriotism among farmers is just as strong as among people in other occupations, but there is among them a very strong feeling that they have been made "goats" in the past 40 years, and there is among them an equally strong determination that this period is coming to an end, and that the rest of the people must step up and pay the price.

There might be a great deal more said on this subject, but my object in writing is simply to enter a protest against your attitude. The writer at present is not interested in farms, although I have been for the most of my life, and possibly may be again.

E. F. MILLER.

32 Franklin Avenue,
Merchantville, N. J.

Selective Conscription and the Food Supply

To the Editor: I have watched with interest the sentiment in favor of selective conscription, such as outlined in the general staff bill, and trust that Congress will realize at once the wisdom of making conscription selective. It is obvious to every loyal deep-thinking citizen of the United States that the skilled workers of the industries and agriculture can do more to bring about the successful termination of war for our country by concentrating their brains and energies in their respective vocations than they can possibly do on the firing line.

The writer being actively engaged in agriculture

and horticulture, as well as being a designing and mechanical engineer, wishes to emphasize the President's statement published in THE IRON AGE of April 19, "Food A Supreme Need," and to answer the New England company's letter published in the same issue on page 956, "Will Food Products Be Reduced?" Quoting this letter in part, "If the farmers take the same attitude that is being taken by the manufacturers with regard to profits on Government work, then we should see a quick drop in prices on food products."

When it is remembered that the farmers in many sections of the United States have sustained considerable losses within the past two years due to unfavorable weather conditions, which have aggregated an enormous reduction in the food supply, the idea or attitude with regard to profits is absurd. While it is true that the prices which are being paid for farm products would show an excessive profit if produced under normal conditions, but taking into consideration the circumstances under which the present food supply has been produced, the high price does not compensate for the shortage in production. While this is not a first class agricultural section, there were thousands of acres of very fertile land planted to corn in 1916 which were completely destroyed by flood, and in an attempt to relieve the condition brought about by this loss the farmers planted large areas in winter wheat which was injured by the severe freeze to the extent that the harvest will not yield the seed sown. With similar conditions existing throughout the United States, the food producers are facing a crisis hitherto unknown in the history of our country, and under such existing circumstances, the producers can assume no attitude which will affect the prices, for there have been little or no profits made.

While I tender my service to the Government in an engineering capacity, I urge that selective conscription be adopted, and that those who are engaged in producing food supplies be permitted to remain at their post until the safety of the nation demands their service elsewhere, for an army without food can do no more than an army without arms, and the President and Congress should assist in every way possible to make up for the present deficiency, for food is the supreme need.

SAMUEL H. KENNEDY, M.E.

Tunnel Hill, Ga., May 1, 1917.

(The selective conscription bill passed both branches of Congress by overwhelming vote, and agreement in conference committee was finally reached May 15—ED. IRON AGE.)

Big Business

To the Editor: The purport of Mr. Buckingham's lecture, as reported under the title "The Size of a Business" in your issue of April 26, is too vital to pass unchallenged. To substantiate his argument that the larger the concern the higher the price paid for materials he gives comparative figures taken from the census of 1910. This gives one an opportunity to diagnose the case and, to my mind, detect the flaw in his deductions. Take for example the figures relating to "Foundry and Machine Shops" which show:

Costs Per \$100 of Sales			
Volume of Sales Per Annum	Material	Labor	Total Material and Labor
\$5,000	\$32.10	\$40.40	\$72.50
1,000,000	43.10	32.20	75.30

Why on earth should we swallow the suggestion that the large concern pays more for its material than the smaller? He loses sight of the fact that the figures show the ratio per \$100 worth of sales, and not the cost for equivalent quantity of material. They do show that the customer gets more value for his \$100 when purchasing from the concern with the largest turnover, as their big production backed by scientific management enables them to cut their profits per unit—hence the high ratio of material costs to sales.

Surely Mr. Buckingham will do well to give this important point further consideration, and either con-

firm or retract his contention through your medium for the benefit of numerous subscribers.

W. WATSON.

Bayonne, N. J., April 30.

Australia and New Zealand as Markets for American Products

To the Editor: I have just read the publication entitled "The Buying Units of THE IRON AGE." Before I read far I could not help feeling what splendid and almost unlimited possibilities there are for many of the firms mentioned in that book by thoroughly investigating two young and growing markets, Australia and New Zealand. With the opportunities I had when in those countries for making the closest investigation of marketing conditions and the peculiarities of trade, I am really surprised to know how few of our American manufacturers go after this profitable trade. While in Australia I was further surprised to see how many agents handled American goods. Knowing the capacity of some of those firms and the possibilities of the American products, I am still puzzled to know why we do not get busy down there.

Right now, while the nations that have been supplying those markets with their needs are embroiled in war and replacing their overseas manufacturing needs with the making of munitions, there is an opportunity for the American manufacturer to get thoroughly established on a highly profitable basis—an opportunity that if neglected will surely result in regret later when the warring nations set about to reinstate their trade overseas.

To give a list of the machinery and goods that would find a good market there would be to almost give the names of every advertiser in THE IRON AGE. One particularly rich field is the electrical; another is agricultural machinery. To go into the trade possibilities and discuss the peculiarities of the trade conditions as they affect each individual article would take up more space than the editor might be willing to give. If we are anxious to get the maximum results from these markets, and the output and possibilities can be developed, I would strongly advise against appointing agents. These firms or individuals have to make a huge profit out of perhaps one article to keep them going for perhaps many months. From this you will see that the price of the article, after duty and transportation are paid, makes a buyer think twice and perhaps devise cheaper means—which eventually result, however, in false economy. In mining machinery there is a rich field because the mines of those lands are developing on every hand. Steel manufacturers should find great possibilities there.

I have already written articles dealing with the automobile and truck possibilities in Australia and New Zealand. Agency methods are doing more harm to American car sales than appears at first. Considering the immensity of the possible output of light cars I am at a loss to understand why this trade is not gone after more earnestly by establishing direct selling offices. The cost of the car to the buyer would be less and sales therefore would be greater.

It would be an excellent idea for a number of our manufacturers to combine in this particular field and build up a branch and control its distribution. How can an export firm that handles competing lines from producers in England, France, Scotland, Germany, Italy, etc., devote all its energies to increasing the sale of our goods?

A number of American manufacturers have made attempts to get in on these markets at various times, but have failed utterly through not knowing the people, their ideals and peculiarities. It must be remembered that our ways are not their ways. Systems of merchandising that have proved successful here will not be successful there. It is a matter of great regret that our travelers have taken the attitude they have with the Australian firms. This matter has already been referred to by the two most influential newspapers there, and when they speak it means something. If

tact in salesmanship is required in any countries more than another it is in Australia and New Zealand.

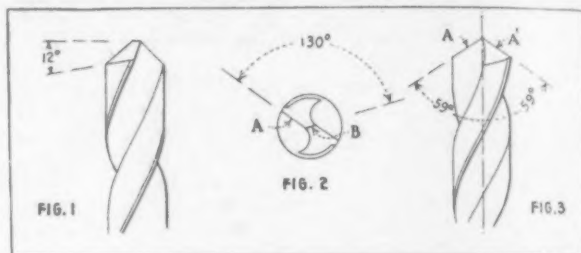
I hope those who are interested in this trade will investigate the conditions thoroughly. Those that are already represented should see if there is not something wrong in the fact that they are not getting more trade than at present.

ROBERT A. WALLACE,

Of Gardner Advertising Company.
St. Louis, Mo., May 5, 1917.

Grinding High-Speed Drills

To the Editor: Improper grinding is the cause of a large proportion of unsatisfactory results obtained in the use of high-speed drills, and I think your readers would be interested in a few pointers as to the proper shop method, although I do not claim that this method



Angles to Observe in Grinding Twist Drills

is the only way to obtain the greatest efficiency, but it is merely given as a suggestion.

In my opinion it is necessary for a drill to be properly ground at the point to insure maximum efficiency and to avoid splitting. When sharpening, clearance should always be taken into consideration. The angle of 12 deg. at the periphery has been proved to be the best for the majority of work and the angle of the cutting edge as shown in Fig. 2 should be 130 deg. with the dead center line *B* shown, not less than 125 deg. The cutting edge *A* and *A'* as indicated in Fig. 3 must be of the same angle and line with relation to the center of the drill. For general work 59 deg. is accepted as being as nearly correct as possible.

There is also another important matter that should be taken into serious consideration, and that is in the selection of a suitable wheel for sharpening and I think that most shop men will agree with me in the statement that no water should be used in this operation, as it tends to cause surface cracks to form, and in a number of instances the point of the drill crumbles.

C. M. BIGGER,
District Manager,

Vanadium Alloys Steel Company, Cincinnati, Ohio.

Union Iron Works Asks Pledge of Loyalty

A printed obligation of loyalty has been distributed among the employees of the Union Iron Works, San Francisco, with the request that each employee sign the obligation form and return it to the general manager's office. The obligation, which has a line for the signature of a witness as well as for the signing employee, reads as follows:

I do solemnly swear that I will bear true faith and allegiance to the United States of America, and that I will serve them honestly and faithfully against all their enemies whomsoever, and that I will obey the orders of the President of the United States and the orders of the officers appointed over me.

I do also solemnly swear that I will serve honestly and faithfully the Union Iron Works Company and will allow no person to cause any loss or damage to a fellow employee or any loss or damage to the property or interests of the Union Iron Works Company; and I do take these obligations freely without any mental or other reservation; so help me God.

The Chicago office of the Central Steel Company has been removed from its former location, 1512 Lytton Building, to room 1370, Peoples Gas Building, 122 South Michigan Avenue. A. Schaeffer, district sales manager, is in charge of the office.

IMPLEMENT STEEL SUPPLY

Manufacturers Present Their Case to Washington Authorities

The officers and a special committee of the National Implement and Vehicle Association, which embraces all the important manufacturers of agricultural implements in the country, have received partial assurances from department heads at Washington that the implement industry will not be deprived of steel wherewith to perform its function of increasing and conserving food production; but these assurances are not yet as definite as the manufacturers would like to have them. Prominent members of the association and the special committee have conferred with the Secretary of Agriculture and others in Washington. Secretary and General Manager E. W. McCullough, Chicago, in a bulletin just issued to the members of the association says in part:

"What we are contending for is that our industry shall be placed on the preferred list with munitions and other equally important necessities in guaranteeing an uninterrupted supply of all necessary materials, the protection of our labor against draft, and that there shall be no transportation embargoes applying to either the materials entering into implements and machinery or the distribution of the finished product.

"Careful investigation shows that with some exceptions the crops for this year can be produced with the implements now available, but as fall plowing begins in the Southwest within the next 40 days, it is necessary for the manufacturer to know immediately as to his material supply and to plan his program for production for fall and spring trade.

"Officers of the National and Eastern Dealers federations conferred with us last week and contributed much valuable information relative to the situation, which indicated clearly that not only are stocks of implements low in the greater portion of the territory, but since the beginning of the war many farmers have not replenished their equipment as usual; consequently, generally speaking, their operating equipment is more nearly worn out at this time than for many years.

"We believe the manufacturers of steel and other materials generally desire to do the right thing by our industry, but they are not without their troubles and no doubt are waiting for the Government to determine its attitude and to advise them what it is.

"It is reported that in some sections where trade has been light, owing to the failure of winter wheat, implements have been offered without consideration as to their replacement value, leading the farmer to believe that the supply is still abundant, and implements will not be difficult to obtain."

New Steel Plant Near Milwaukee

PITTSBURGH, May 15.—The Valley Steel Company has been organized by Milwaukee and other capitalists and will erect a steel plant at St. Francis, three miles from Milwaukee, and located on Lake Michigan. The plant will contain two 60-ton open hearth furnaces, a 24-in. billet mill, a 10-in. merchant bar mill, and later a 104-in. plate mill will be added. The company itself will erect the two open hearth furnaces, while the contract for the billet and merchant bar mill has been placed with the United Engineering & Foundry Company, Pittsburgh. The contract for the plate mill is to be placed later. W. E. Moore & Co., consulting engineers, Union Bank Building, Pittsburgh, are engineers for the construction of this plant.

The Railway Tie Corporation, which recently acquired an existing plant at East St. Louis, Ill., has begun improvements and extensions and will install equipment for the manufacture of bar iron, rail joints, tie plates and similar accessories. A general machine shop business will also be included. The offices of the company will be maintained in the Railway Exchange, St. Louis.

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Pacific Coast Steel Merger Denied

A report that the Pacific Coast Steel Company had acquired for \$1,800,000 the open-hearth steel plant and rolling mills of the Judson Mfg. Company, San Francisco; the open-hearth plant of the Llewellyn Iron Works at Torrance, near Los Angeles, and the open-hearth plant and rolling mills of the Southern California Iron & Steel Corporation, Los Angeles, is denied by both the Pacific Coast Steel and the Judson companies. There has been an option out for some Judson stock, it is stated, but it was not exercised.

Iron and Steel Markets

MORE PLATES FOR SHIPS

Government to Make Larger Demands

Washington's Steel Needs Develop Slowly—
Freight Congestion More Serious

The Government's needs in steel are still indefinite and producers are patiently awaiting the development of its plans. Meanwhile the uncertainty hampers consumers as well as the mills, and there is a growing belief that domestic users of plates will find more rather than less difficulty in supplying their wants.

The joint buying of war steel, copper and other metals by the Government and its Allies, predicted in this column two weeks ago, is now plainly indicated from Washington. The more rapid development of the shipbuilding program is looked for at the same time in the effort to increase the country's output of vessels considerably beyond the 1,000,000 tons that has been counted on for this year.

The estimate of some authorities that eventually the ship plate capacity of the country will be almost entirely taken up by the Government is surprising in view of an output last year of probably 1,750,000 tons of sheared plates over $\frac{1}{4}$ -in. in thickness, besides more than 1,500,000 tons of universal plates and plates under $\frac{1}{4}$ in. thick. Even if 2,000,000 tons of steel vessels could be built in 1918 that would represent less than 1,000,000 tons of plates and structural shapes, of which the latter would be more than 20 per cent.

A definite step toward starting the fabricating shops of the country on ship work is the Government canvass now under way, to ascertain the extent of available capacity for steel fabrication.

The letting of Government contracts for big guns, for rifles and for shells has already put many plants in various lines at work and several large machine tool contracts have been closed, with others pending. Some round purchases of shell steel to go into Government contracts are under way.

While derangement of mill schedules to meet Government wants is not yet a serious factor, apart from a rather heavy inroad on plate mill capacity in the Pittsburgh district, the railroad situation is again worse and rolling mill congestion in western Pennsylvania is cutting down output, particularly in the heavier products. The omission of pig iron and steel from the preferential freight lists of the railroad board at Washington, if persisted in, will mean a further reduction of 20 per cent in car supply at some works.

Government activity in limiting exports of tin plate has sent prices soaring, neutral buyers making offers such as \$25.75 for 100,000 double boxes, and one mill has quoted \$15 per base box.

Efforts to get steel products for export and for home consumption show that high prices are no obstacle. Wire rods have sold at \$85, \$87.50, \$90, and as high as \$95, and small billets at 5c. per pound.

Railroad buying, lately held back by increasing

uncertainties, is starting again. Recent rail sales of the Steel Corporation, in part for 1919, have amounted to 60,000 tons. A Russian inquiry is for 25,000 tons of 67½-lb. rails for the department of the Caucasus, but Russian business, under present conditions, is getting scant attention. The New York Central is in the market for 300 locomotives and 1000 cars, and its car purchases are expected to reach 5000. None of the steel car works is running at more than 50 per cent capacity, chiefly because of short supply of steel.

Plate prices are still without limit. On 1000 tons of hull plates to Canada, 10.40c. was paid, and on tank plates 7.25c. is now common, with 7.50c. and 8c. asked by some Central Western mills.

The reported decrease in automobile buying has not yet affected mill specifications and shipments of bars and sheets to that trade continue heavy.

The wire rope required by the Government and its Allies, chiefly France, at first put at 9000 tons, is now estimated at 24,000 tons for this year. Manufacturers have arranged for its distribution, and wire manufacturers are to meet on Friday to apportion the requisite wire.

Fabricating works took contracts in April representing 61 per cent of capacity. On a convention hall at Cleveland, 3250 tons, \$178 was bid for erection and fabrication, and 600 days were asked for the completion of the work.

Pig-iron markets show little feature, and buying for the first half of 1918 again lags as prices asked for such delivery come closer to those for spot iron.

The Government is making a survey of the ferromanganese situation through a committee representing importers as well as domestic manufacturers. Steel companies are to report stocks on hand, requirements in the remainder of the year and expected receipts under existing contracts. It is fortunate that domestic production is increasing, even though slightly, as indications are that Great Britain will not be able to furnish as much ferromanganese this year as in 1916.

Pittsburgh

PITTSBURGH, PA., May 15, 1917.

The steel trade is still very much in the dark as to the amount of steel in various forms wanted by the Government, this being due very largely to the fact that the departments at Washington that will have to do with the placing of Government contracts for steel have not as yet been thoroughly systematized. Recently, the Government was furnished a complete list of steel fabricating concerns in the United States, together with their theoretical capacities for fabricating steel, and is also understood to have been furnished lists of makers of other forms of steel. It is likely the heads of some of the larger steel companies will be in consultation with Government officials at Washington, D. C., within the next week, to give their assistance in trying to put the purchasing departments on a better basis. It is now said that purchases of steel by the Government already aggregate close to 1,000,000 tons, but this information has not been officially confirmed and may not be true. The local steel trade is very much up in the air as to what it will have to supply to the Government, and is in the position that it does not know how much material it will be able to spare for its

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics
At date, one week, one month, and one year previous

For Early Delivery

Pig Iron, Per Gross Ton:	May 16, 1917.	May 9, 1917.	April 18, 1917.	May 17, 1916.
No. 1, Philadelphia...	\$43.50	\$42.50	\$42.00	\$20.50
No. 2, Valley furnace...	42.00	42.00	40.00	18.00
No. 2, Southern, Cin'tl...	42.90	40.90	37.90	17.90
No. 2, Birmingham, Ala.	40.00	38.00	35.00	15.00
No. 2, furnace, Chicago*	44.00	42.00	39.00	19.00
Basic, del'd, eastern Pa.	38.00	38.00	38.00	20.50
Basic, Valley furnace...	42.00	42.00	40.00	18.00
Bessemer, Pittsburgh...	44.95	44.95	42.95	21.95
Malleable Besse, Ch'go*	44.00	42.00	39.00	19.50
Gray forge, Pittsburgh...	40.95	40.95	38.95	18.70
L. S. charcoal, Chicago...	46.75	46.75	41.75	19.75

Rails, Billets, etc., Per Gross Ton:

Bess. rails, heavy, at mill	38.00	38.00	38.00	33.00
O.-h. rails, heavy, at mill	40.00	40.00	40.00	35.00
Bess. billets, Pittsburgh...	85.00	80.00	75.00	45.00
O.-h. billets, Pittsburgh...	85.00	80.00	75.00	43.00
O.-h. sheet bars, P'gh...	85.00	80.00	77.50	43.00
Forging billets, base, P'gh	105.00	105.00	100.00	69.00
O.-h. billets, Phila...	75.00	75.00	75.00	50.00
Wire rods, Pittsburgh...	85.00	85.00	85.00	60.00

Finished Iron and Steel,

Per Lb. to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Iron bars, Philadelphia...	4.159	4.159	3.659	2.659
Iron bars, Pittsburgh...	4.00	3.75	3.50	2.60
Iron bars, Chicago...	3.50	3.25	3.25	2.35
Steel bars, Pittsburgh...	4.00	4.00	3.75	3.00
Steel bars, New York...	4.169	4.169	3.919	3.169
Tank plates, Pittsburgh...	6.50	6.50	6.00	3.75
Tank plates, New York...	6.919	6.669	6.169	3.919
Beams etc., Pittsburgh...	4.00	4.00	4.00	2.60
Beams etc., New York...	4.419	4.419	4.169	2.769
Skelp, grooved steel, P'gh	3.50	3.50	3.50	2.35
Skelp, sheared steel, P'gh	5.50	5.50	5.50	2.45
Steel hoops, Pittsburgh...	4.25	4.25	4.25	3.00

*The average switching charge for delivery to foundries in the Chicago district is 50c. per ton.

Sheets, Nails and Wire, Per Lb. to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Sheets, black, No. 28, P'gh	7.00	6.50	5.75	2.90
Sheets, galv., No. 28, P'gh	8.00	8.00	7.50	5.00
Wire nails, Pittsburgh...	3.50	3.50	3.20	2.50
Cut nails, Pittsburgh...	3.75	3.75	3.75	2.60
Fence wire, base, P'gh...	3.45	3.45	3.15	2.45
Barb wire, galv., P'gh...	4.35	4.35	4.05	3.25

Old Material, Per Gross Ton:

Iron rails, Chicago...	\$32.50	\$32.50	\$32.00	\$18.00
Iron rails, Philadelphia...	34.00	34.00	31.00	20.00
Carwheels, Chicago...	25.50	24.25	24.00	13.00
Carwheels, Philadelphia...	27.00	27.00	26.00	16.50
Heavy steel scrap, P'gh...	29.00	28.00	27.00	17.00
Heavy steel scrap, Phila...	25.00	25.00	25.00	16.50
Heavy steel scrap, Ch'go...	28.50	27.00	27.50	16.00
No. 1 cast, Pittsburgh...	26.00	24.00	24.00	16.25
No. 1 cast, Philadelphia...	29.00	28.00	27.00	17.50
No. 1 cast, Ch'go (net ton)	22.00	21.50	20.75	12.50
No. 1 RR. wrot, Phila...	41.00	41.00	36.00	23.00
No. 1 RR. wrot, Ch'go (net)	31.00	31.00	30.00	16.75

Coke, Connellsville, Per Net Ton at Oven:

Furnace coke, prompt...	\$8.00	\$7.50	\$7.50	\$2.25
Furnace coke, future...	7.50	7.50	8.00	2.50
Foundry coke, prompt...	9.00	8.50	9.50	3.00
Foundry coke, future...	9.00	9.00	9.00	3.25

Metals,

Per Lb. to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Lake copper, New York...	31.50	31.00	30.50	29.00
Electrolytic copper, N. Y.	31.50	31.00	30.50	28.62 1/2
Spelter, St. Louis...	9.12 1/2	9.12 1/2	9.50	15.25
Spelter, New York...	9.37 1/2	9.37 1/2	9.75	15.50
Lead, St. Louis...	10.37 1/2	10.25	9.20	7.40
Lead, New York...	10.50	10.45	9.40	7.50
Tin, New York...	65.75	59.37 1/2	55.25	49.25
Antimony (Asiatic), N. Y.	20.00	25.00	34.50	33.00
Tin plate, 100-lb. box, P'gh	\$8.50	\$8.50	\$8.00	\$6.50

domestic consumers. Rolling schedules are bound to be more or less disarranged, reducing output to a considerable extent, when the mills start to roll Government orders. The car situation is less satisfactory than it was a week or two ago, and the Baltimore & Ohio Railroad has just declared an embargo on all its lines on less than carload shipments. An accident in the St. Mary's River, by which two 6800-ton ore boats were sunk, will not interfere with navigation, as ore boats coming down will be able to get around the sunken boats. The past week has been quiet in the local trade in pig iron, semi-finished steel, and also in finished material. Prices ruling are abnormally high, there is much uncertainty as to what the Government will buy, mills are holding off quoting to domestic consumers, and the latter are not anxious to place contracts until the situation is clearer. Pig iron prices are unchanged, but a few small lots of Bessemer iron have sold at \$45 at furnace. Prices on prompt coke are a little higher and scrap is ruling firm, with very little material selling to consumers. Prices on refined iron bars were advanced \$5 per ton, or to four cents per lb. at mill.

Pig Iron.—The past week has been very dull in the pig-iron trade, only small lots of Bessemer and basic having been sold, and these at practically unchanged prices. It is true that a few small lots of Bessemer iron, ranging from 200 to 500 tons, have been sold at \$45, at furnace, but no large sales have been made. There is very little new inquiry for Bessemer or basic, but a fair amount of No. 2 foundry iron is being sold at \$42 at furnace, for delivery over second half of this year, and \$40 at furnace for delivery over first half of 1918. There is some inquiry for malleable Bessemer iron, and several fairly large lots have been sold at \$42 to \$43 at furnace. Nothing was done here on the inquiry from Italy for 10,000 tons of Bessemer iron, which came out last week. We quote standard Bessemer iron at \$44 to \$45; basic, \$42; No. 2 foundry for delivery over remainder of this year, \$42; small lots for prompt shipment, \$43, and for first half of

1918, \$40; gray forge, \$40; and malleable Bessemer, \$42 to \$43, all f.o.b. cars at Valley furnace. The freight rate for delivery in the Cleveland and Pittsburgh districts is 95c. per ton.

Billets and Sheet Bars.—Only a very limited amount of semi-finished steel is being sold, the new demand being limited while the mills are sold up for months ahead, and have no steel to spare. There is a heavy demand for shell steel, an inquiry being in this market at present for 5000 tons of 4 1/4-in. rounds, 16,500 tons of 7-in. rounds and 39,600 tons of 10 1/2 by 12 3/4-in. rounds for the manufacture of shells. This material is believed to be intended for export to France, the inquiry coming here from a large New York exporting concern. We note a sale of 300 tons of discard steel at \$40 per gross ton, maker's mill. Reports of sales of Bessemer and open-hearth steel bars at \$100 at mill are believed to be incorrect. We quote soft Bessemer and open-hearth billets and sheet bars at \$85 to \$90 per ton, maker's mill, Pittsburgh or Youngstown. It is probable that none of the steel mills would sell below \$85, but several dealers have secured small lots of billets and sheet bars in exchanges or trades, which they are offering to consumers at less than mill prices. Forging billets range from \$100 to \$110 for ordinary sizes and carbons.

Ferrolloys.—The new demand for ferromanganese is quiet, indicating that consumers are well covered for some time ahead, and are getting fairly good deliveries. Domestic 80 per cent ferromanganese is still being offered in carload lots for prompt shipment, at \$400 to \$425 per ton. A sale of two cars for prompt shipment is reported at about \$410, delivered. We quote 80 per cent domestic ferromanganese at \$400 to \$425, delivered, but some sellers are refusing to quote the lower prices. Small lots of 50 per cent ferrosilicon are still being sold at \$200 to \$250 per ton, for prompt shipment. A strike has taken place among employees of the Globe Iron Company, Star Furnace Company and Jackson Iron and Steel Company, all at Jackson, Ohio, and the

stacks of these three concerns, all of which make Bessemer ferrosilicon, are banked and will be until the trouble is adjusted. We note a sale of 300 tons of 10 per cent, and one of 100 tons of 10 per cent, at \$65, at furnace, for last of this year delivery.

We quote 80 per cent domestic ferromanganese at \$400 to \$425 per gross ton, delivered. The famine in supply of 50 per cent ferrosilicon still exists, and small lots are being sold at \$200 to \$250 delivered. Spiegeleisen continues to sell at about \$4 per point, and we quote 18 to 22 per cent at \$75 to \$80 and 25 to 30 per cent at \$100 to \$110, delivered. We quote 9 per cent Bessemer ferrosilicon at \$64, 10 per cent \$65, 11 per cent \$67, 12 per cent \$70, 13 per cent \$75, 14 per cent \$80, 15 per cent \$85, and 16 per cent \$90. We quote 7 per cent silvery iron at \$46 to \$47; 8 per cent, \$47 to \$48; 9 per cent, \$49 to \$50; 10 per cent, \$50 to \$51, 11 and 12 per cent, \$52 to \$53, all f.o.b. at furnace, Jackson or New Straitsville, Ohio, and Ashland, Ky., these furnaces having uniform freight rates of \$2 per ton for delivery in the Pittsburgh district.

Structural Material.—It is believed the Government will soon place large orders for fabricated steel, as recently it has been furnished a complete list of all the steel fabricating concerns in the United States, together with their theoretical capacities. New inquiry in the past week has been light, structural steel fabricators not being anxious to bid on much new work from the domestic trade, until they have some idea of how much material they may have to furnish to the Government. The McClintic Marshall Company has taken 3000 tons for new steel buildings for an addition of two units to the Seamless Steel Tube plant of the Pittsburgh Steel Company at Monessen, Pa., and the Blaw Steel Construction Company, Hoboken, Pa., has taken 500 tons for a new steel building for the General Electric Company, at Schenectady, N. Y. There was only one bid, this being from the King Bridge Company, Cleveland, for the auditorium to be built in that city, its bid being 8½c to 11c per lb. erected, for the different kinds of work. Owing to the high prices quoted, it is not believed anything definite will be done on this project at present.

We quote beams and channels up to 15 in. at 4c. at mill for fairly prompt delivery, while small lots from warehouse bring up to 5c. and higher, depending upon quantity.

Plates.—No new car orders have come out in the past week, and the plate mills will likely be slow in taking on new orders until they have some definite advices as to how much material the Government will want. Its demands are certain to be very heavy, and with the congested condition of the mills as regards orders already on their books, the outlook for domestic consumers being able to get plates within a reasonable time is very discouraging. There is a very wide range in prices of plates, making the market very difficult to quote. Mills that could furnish sheared plates for fairly prompt delivery, say in three or four months, would have no trouble in getting 7c per lb. at mill. However, on inquiries from regular customers, plate mills are quoting from 6c to 7c at mill, for indefinite deliveries, while for fairly prompt shipment 8c to 9c at mill is being quoted. Ship plates are quoted from 9c to 10c. Prices on sheared plates from warehouse range up to 10c and higher.

Steel Rails.—No orders are being placed for standard sections, but orders for light rails are active from the coal-mining and lumber interests. Mills rolling light rails from billets are sold up for the year or more. Re-rolling light rail mills are also sold up for months ahead.

We quote angle bars at 2.75c. at mill, when sold in connection with orders for standard section rails, and on carload and smaller lots, 3c. to 3.25c. at mill. We quote light rails as follows: 25 to 45 lb., \$60; 16 to 20 lb., \$61; 12 and 14 lb., \$62; 8 and 10 lb., \$63; in carload lots, f.o.b. mill, with usual extras for less than carloads. Standard section rails of Bessemer stock are held at \$38, and open-hearth \$40, per gross ton, Pittsburgh.

Sheets.—The mills report a continued heavy demand for all grades of sheets, with the scarcity in supply for prompt shipment getting more acute. The American Sheet & Tin Plate Company is practically out of the market as a seller, having allotted and sold its entire output of sheets some time ago to its regular trade. It is very evident that some customers were not fully taken care of, as independent sheet mills

report getting inquiries for sheets from concerns to which they have never before sold. The purchases already made by the Government, with those to be made later, have disarranged schedules of sheet mills to some extent and have further delayed deliveries. Nothing has been given out as to the actual quantities of sheets sold to the Government, but it is known that local mills, and also mills in the Youngstown and Niles, Ohio, districts have taken good-sized orders. Prices are very firm, premiums still being readily paid for fairly prompt delivery. We have again advanced our prices, and now quote blue annealed sheets, for fairly prompt delivery, Nos. 3 to 8 gage, 6c. to 6.50c.; box annealed, one-pass Bessemer, cold-rolled, No. 28 gage, 7c. to 7.50c.; No. 28 galvanized, 8c. to 9c.; and No. 28 black plate, tin-mill sizes, 6.50c. to 7c.; all f.o.b. mill, Pittsburgh. These prices are for carload and larger lots, for delivery over the next two or three months. For prompt delivery, premiums of from \$5 to \$10 per ton or more would have to be paid. No. 28 gage Bessemer black sheets, cold-rolled, have sold for spot delivery at 8c. or higher, and No. 28 gage, galvanized, at 9c. at mill.

Tin Plate.—It is now said that an embargo on tin plate for export may be placed in a very short time. Recommendations are made to tin-plate makers to give preference to shipments of tin plate for cans for perishable foods, and to hold back shipments to can makers whose trade is with packers who can use paper containers for non-perishable foods. Owing to the famine in the supply of tin plate for cans, tobacco interests and others are experimenting with paper containers, with the idea of substituting them for tin cans and tin box containers. The Government and the tin-plate makers as well are bending every energy to increase, if possible, the output of bright tin plate for cans, and it is said that employees in some tin-plate plants are being quietly sounded as to whether they would be willing to work two turns on Sundays. The matter has been put up to the men in the form that it is a patriotic duty, and this experiment may be tried in several tin-plate mills before long. None of the tin-plate mills is quoting on export inquiries, although fabulous prices have been offered for fairly quick shipment of tin plate to Japan and other foreign countries. On current orders from stock we quote primes at \$8.50 to \$9, and wasters 25c. less per box. Most tin-plate makers have practically nothing to sell for this year delivery.

We quote long terme plate, No. 28 gage base, at \$7.25 to \$7.50; short terme plate, \$12 to \$12.50, maker's mill, prices depending on quantity and delivery wanted. The present schedule of prices on terme plate is as follows: 8-lb., 200 sheets, \$14 per package; 8-lb., 214 sheets, \$14.30 per package; 12-lb., I. C., \$15.25 per package; 15-lb., I. C., \$15.75 per package; 20-lb., I. C., \$16.50; 25-lb., I. C., \$17.25; 30-lb., I. C., \$18; 35-lb., I. C., \$18.75; 40-lb., I. C., \$19.50.

Iron and Steel Bars.—On Friday, May 11, several local makers of refined iron bars advanced prices \$5 per ton, or from 3.75c. to 4c. at mill. On both iron and steel bars, mills are well sold up for the remainder of this year, the Carnegie Steel Company being reported entirely sold up, while two or three other makers of steel bars have a limited quantity for last-quarter delivery. Local makers of iron bars also have some for shipment in fourth quarter, but are not actively seeking new orders, as the product will be needed for regular trade. The demand for reinforcing steel bars is only fair, and prices ruling are relatively low. The general market on steel bars is 4c. at mill, or higher, but several makers are quoting 3.75c. for delivery late in the year. We therefore quote steel bars at 3.75c. to 4c., depending on delivery, and 4.50c. to 5c. from warehouses, in small lots, for prompt shipment. We quote refined iron bars at 4c. and railroad test bars 4.10c. at mill, in carload and larger lots.

Wire Nails.—An inquiry is in the market from the Allies for 240,000 kegs of 1½ lb. each, or a total of 12,000 gross tons. Three or four local makers have each quoted on a portion of this business, prices quoted being somewhat higher than the domestic market, but so far no part of the inquiry has been closed. The statement that the American Steel & Wire Company had officially retired from the market as a seller is incorrect. This

interest is taking care, as best it can, of its regular trade in nails and wire, and at prices ruling prior to the advance made by the independent mills, which went into effect on April 17, so that there are really two sets of prices ruling in the wire trade. The current demand is heavy and mills are not catching up on deliveries. Prices in effect to the jobbing trade, in carload and larger lots, except by the American Steel & Wire Company, are as follows:

Wire nails, \$3.50 base per keg; galvanized, 1 in. and longer, including large-head barb roofing nails, taking an advance over this price of \$2, and shorter than 1 in., \$2.50. Bright basic wire is \$3.55 per 100 lb.; annealed fence wire, Nos. 6 to 9, \$3.45; galvanized wire, \$4.15; galvanized barb wire and fence staples, \$4.35; painted barb wire, \$3.65; polished fence staples, \$3.65; cement-coated nails, \$3.40 base, these prices being subject to the usual advances for the smaller trade, all f.o.b. Pittsburgh, freight added to point of delivery, terms 60 days net, less 2 per cent off for cash in 10 days. Discounts on woven-wire fencing are 48 per cent off list for carload lots, 47 per cent off for 1000-rod lots, and 46 per cent off for small lots, f.o.b. Pittsburgh.

Wire Rods.—The domestic and export demand for wire rods continues very heavy and many inquiries are being turned down by the mills, which are unable to supply the rods and make the deliveries wanted. Recently a fairly large lot of screw stock rods was sold at above \$95 at mill, and a sale of 500 tons of high carbon rods was made at \$110, f.o.b. New York, for export. The manganese desired in rods is now practically as important as the carbons, owing to the very high prices at which ferromanganese is selling. Makers state there is no trouble in getting \$85 to \$90 for soft Bessemer or open hearth rods, when they can spare them. A local mill has sold a fairly large lot of high carbon rods, rolled from acid open hearth steel, at about \$110 at mill.

We quote soft Bessemer and open-hearth rods to domestic consumers at \$85 to \$90; high-carbon rods made from ordinary open-hearth steel, \$90 to \$100, and special steel rods, with carbons running from 0.75 to 0.90, \$100 to \$115 at mill.

Hoops and Bands.—The demand is heavy for both hoops and bands, and mills are sold up for months ahead. Prices on hoops range from 4.25c. to 4.50c. and on steel bands from 3.75c. to 4c. at mill, extras as per the steel bar card. One maker has sold fairly large lots of steel bands for delivery over the next three or four months at 4.25c. at mills.

Shafting.—The new demand is heavy, and specifications are coming in very freely, especially from the screw stock and automobile trade. Prices are very strong, but most consumers are covered over third quarter and some for the entire year. We quote cold-rolled shafting at 15 to 5 per cent off list, the larger discount being given only to the very heaviest buyers and on desirable contracts.

Railroad Spikes and Track Bolts.—No large new orders have been placed in the past week, and railroads are not specifying very freely against contracts. Prices on both spikes and track bolts are very firm, and makers are somewhat indifferent about taking new orders, as they can put steel into other products that are selling at very high prices, and on which they are very much behind in deliveries. We quote track bolts with square nuts at 5.35c. to 5.50c. to railroads and 5.50c. and up to 7c. and 8c. in smaller lots for prompt shipment. Railroad spikes, 9/16 in. and larger, are \$3.85, base; 7/16 and 1/2 in., \$3.95, base; 5/16 and 3/8 in., \$4.20, base. Boat spikes are \$4.10, base, all per 100 lb., f.o.b. Pittsburgh.

Nuts and Bolts.—Makers report the new demand as quite heavy, and say that for the past three or four weeks new orders entered have been in excess of shipments. Deliveries of steel are still very slow, and this with the shortage in labor, is cutting down output of nuts and bolts very much below normal. There is still a heavy export inquiry for both nuts and bolts, but owing to the troubles with foreign shipments, incident to shortage in cars and also in bottoms, makers are indifferent about quoting on foreign inquiries. Most makers are back in deliveries eight to 10 weeks, and until the supply of steel and labor improves, say they will not be able to catch up to any extent. Most consumers are covered over third quarter, and a few of the larger users, over remainder of this year. An advance in prices is looked for at an early date. Dis-

counts in effect are as follows, delivered in lots of 300 lb. or more, when the actual freight rate does not exceed 20c. per 100 lb., terms 30 days net, or 1 per cent for cash in 10 days:

Carriage bolts, small, rolled thread, 40 per cent; small, cut thread, 35 and 2 1/2 per cent; large, 25 per cent.

Machine bolts, h. p. nuts, small, rolled thread, 40 and 10 per cent; small, cut thread, 40 per cent; large, 30 per cent.

Machine bolts, c. p. c. and t. nuts, small, 30 per cent; large, 20 per cent. Bolt ends, h. p. nuts, 30 per cent; with c. p. nuts, 20 per cent. Lag screws (cone or gimlet point), 45 per cent.

Nuts, h. p. sq., blank, \$2.10 off list, and tapped, \$1.90 off; hex., blank, \$1.90 off, and tapped, \$1.70 off; nuts, c. p. c. and t. sq., blank, \$1.70 off, and tapped, \$1.50 off; hex. blank, \$1.60 off, and tapped, \$1.40 off. Semi-finished hex. nuts, 50 and 10 per cent. Finished and case-hardened nuts, 50 and 10 per cent.

Rivets 7/16 in. in diameter and smaller, 40 per cent.

Rivets.—Makers report the new demand active, but users are covered over second and third quarters, and some large consumers of rivets over the entire year. Specifications against contracts are heavy and all makers of rivets are very much back in shipments. They say deliveries of steel from the mills are slow, and this is keeping their output down below normal. There is still a heavy export inquiry, but owing to trouble in getting cars and also bottoms, local makers are not inclined to quote on foreign inquiries. Prices in effect from July 1, and also from Oct. 1, are as follows:

Structural rivets, \$4.75 per 100 lb. base; boiler, \$4.85 per 100 lb. base.

From July 1, 1917, to Oct. 1, 1917, structural rivets, \$4.90 per 100 lb. base; boiler, \$5 per 100 lb. base. F.o.b. Pittsburgh, Pa.

Terms: 30 days net or 1/2 of 1 per cent for cash in 10 days.

Cold Rolled Strip Steel.—None of the makers has opened books on contracts for cold rolled strip steel for third quarter delivery, but all are being strongly importuned by consumers to do so. Makers are very much back in deliveries, and most of the cold rolled strip steel that should have been shipped out in second quarter will not be delivered before third quarter, and some of it not until fourth quarter. Prices are firm and small current orders are mostly going at 8c., but in a few special cases 7.50c. is still being named. We quote on current orders 7.50c. to 8c. at mill, for delivery to July 1. Terms are 30 days net, less 2 per cent for cash in 10 days, delivered in quantities of 300 lb. or more when specified for at one time.

Wrought Pipe.—The statement that the National Tube Company has entirely withdrawn from the market as a seller of tubular goods is untrue. For more than a year this company has been confining its sales of tubular goods of all kinds to its regular customers entirely, and is still pursuing this policy. The company has not made any advance in prices on steel pipe since the advance that went into effect April 2. In other words, it is still selling tubular goods to its regular customers at \$10 to \$12 per ton less than is being quoted by the independent mills, which advanced prices \$12 per ton, effective on May 1. The mills are sold up on lap weld iron and steel pipe for practically the remainder of this year, but on butt weld sizes can make deliveries in 10 to 12 weeks. Heavy inquiries are in the market for line pipe, these amounting to 100,000 tons or more, but mills are refusing to quote, as they cannot possibly make the deliveries wanted. There is a heavy export demand for pipe and tubes, but this is also being turned down by the mills for the same reason. Discounts on iron and steel pipe, quoted by the independent mills, are given on another page.

Boiler Tubes.—Many makers of iron and steel tubes are sold up for a year or more, and any mill that can make fairly prompt delivery on either iron or steel tubes can get very heavy premiums over what are regarded as regular prices for forward delivery. In some cases, these premiums have amounted to anywhere between \$25 and \$40 per ton. The nominal discounts on iron and steel tubes, but which do not represent actual prices ruling, are given on another page.

Old Material.—The local scrap market as regards sales is quiet, but prices are very strong, and on some grades of scrap are higher. Recently a very large

consumer of No. 1 foundry cast scrap bought up practically all the available supply in this district, with the result that prices on this material have advanced \$2 per ton or more, and it is very scarce. There is a continued heavy demand for low phosphorus melting stock and high prices are ruling. There is also a good demand for hydraulic compressed sheet scrap, and several fairly large sales were made last week. The available stocks of steel melting scrap are light, and a buying movement would very quickly result in a stiff advance in prices. We note two sales of 3000 tons each of hydraulic compressed sheet scrap, one of 3000 tons at \$23 and the other at \$22.75, per gross ton, both delivered to buyers' mills. We also note a sale of 300 tons of low phosphorus melting stock at \$40 at seller's mill, to a dealer. No embargoes are on to any scrap consuming points in the Pittsburgh district, and scrap is moving more promptly to consumers than for some time. Prices for delivery in Pittsburgh and other consuming points that take Pittsburgh freight rates, per gross ton, are nominally as follows:

Heavy steel melting scrap, Steubenville, Follansbee, Brackenridge, Sharon, Monessen, Midland and Pittsburgh, delivered.....	\$29.00 to \$30.00
No. 1 foundry cast.....	25.50 to 26.00
Re-rolling rails, Newark and Cambridge, Ohio, Cumberland, Md., and Franklin, Pa.....	34.00 to 35.00
Hydraulic compressed sheet scrap.....	22.50 to 23.00
Bundled sheet scrap, sides and ends, f.o.b. consumers' mills, Pittsburgh district.....	19.00 to 20.00
Bundled sheet stamping scrap.....	18.00 to 18.50
No. 1 railroad malleable stock.....	32.00 to 33.00
Railroad grate bars.....	16.00 to 17.00
Low phosphorus melting stock.....	40.00 to 41.00
Iron car axles.....	47.00 to 48.00
Steel car axles.....	50.00 to 52.00
Locomotive axles, steel.....	53.00 to 55.00
No. 1 bushing scrap.....	22.00 to 23.00
Machine-shop turnings.....	14.50 to 15.00
Old carwheels.....	26.00 to 27.00
Cast-iron borings.....	15.50 to 16.00
*Sheet bar crop ends.....	36.00 to 37.00
No. 1 railroad wrought scrap.....	34.00 to 35.00
Heavy steel axle turnings.....	19.00 to 20.00
Heavy breakable cast scrap.....	24.00 to 25.00

*Shipping point.

Coke.—The new demand for prompt furnace coke in the past week has been heavier, and with the car supply not so good, prices are firm and slightly higher. Best grades of spot furnace coke are held at \$8 to \$8.50, per net ton, at oven. Sales in the past week were quite heavy at the range of prices noted above. As yet nothing is being done in closing of contracts for furnace coke for last half of the year delivery, producers not being anxious to close and consumers unwilling to pay \$8 or more for furnace coke asked by the producers. Most users of foundry coke have covered on their supply for last half of the year at about \$9 per net ton, at oven. We now quote best grades of blast furnace coke for prompt shipment at \$8 to \$8.50, and 72-hour foundry at \$9 to \$9.50 per net ton at oven. We quote best grades of 72-hour foundry coke, for last half of the year delivery at \$9 per net ton, at oven. The Connellsville *Courier* gives the output of coke in the upper and lower Connellsville regions for the week ending May 5 as 390,000 tons, an increase over the previous week of about 10,000 tons. This is the heaviest output of coke in the two regions named above for more than a year.

Chicago

CHICAGO, ILL., May 15, 1917.

The fact that steel makers are awaiting announcement of Government needs continues the outstanding feature of the market. Meanwhile, the statement is widely heard that the mills have nothing to sell. It is learned from consumers of ferromanganese and its sellers, that the Government is making a survey of the situation in ferroalloys, inquiring not only as to production, but in regard to stocks, the amounts ordinarily consumed, etc. Prices of finished steel products are difficult to gage because of the variance that exists in quotations, especially of those makers who have little to sell. This is particularly true of sheets. Structural work continues of relatively small importance, and promises to remain so while prices of shapes are where

they are. Mild steel bars range from 3.50c to 4c, Pittsburgh. High-carbon bars are firm at 3.50c., Chicago, and higher prices are indicated by the higher cost of rerolling rails. Northern iron for delivery this year is \$2 higher, at \$44. Southern No. 2 is held at \$44, Chicago, for prompt, and \$40 and upward, for next year. The prices of old material are again on the upward trend. For shovelling steel \$29 has been paid; for old carwheels, \$26 has been offered, while \$36.50 has been paid for old steel rails.

Pig Iron.—Though a considerable tonnage remains to be placed for 1917 delivery, largely on the part of those who have balked at paying the prices asked, most of the important melters have covered their requirements. In the past few days, one of the larger jobbing foundries came in the market for several thousand tons, and placed the business. Buying for next year is fairly active, and it is noted that in the general run of inquiries, deliveries for this year and next are rather evenly specified. Northern No. 2, malleable and basic are quoted at \$44, furnace, an advance of \$2 over last week, for delivery this year, and the 1918 price has been advanced \$1 and is now \$40, furnace. Most of the representatives of Southern producers are not authorized to sell for this year, although some nice orders were taken a few days ago when at least two makers were booking business. The quotations for Southern iron are not so clearly defined as are those for Northern. Considerable iron was sold as mentioned at \$35, Birmingham, for delivery next year, but it is generally agreed that the first-half price is now about \$36, Birmingham, or \$40, Chicago, for No. 2 foundry, running about 2.25 per cent silicon. For this year, if a seller can be found, it is probable that \$40, Birmingham, or \$44, Chicago, would be accepted. Sales have been made on that basis. The prices for silveries are more uncertain than ever for the reason that two producers located at Jackson, Ohio, are contending with strikes. For 8 per cent silvery \$48 to \$49, delivered, may still be named, although higher has been done for standard iron. The makers of Lake Superior charcoal iron announce no change in their quotations. One states that its policy is not to force prices higher, but that its product must be expected to follow the general market. The following quotations are for iron delivered at consumers' yards, except those for Northern foundry, malleable Bessemer and basic irons, which are f.o.b. furnace, and do not include a switching charge averaging 50c. per ton:

Lake Superior charcoal, Nos. 1 to 5.....	\$46.75
Lake Superior charcoal, No. 6 and Scotch.....	48.25
Northern coke foundry, No. 1.....	44.50
Northern coke foundry, No. 2.....	44.00
Northern coke foundry, No. 3.....	43.50
Northern high-phosphorus foundry.....	44.00
Southern coke No. 1 f'dry and 1 soft.....	44.50
Southern coke No. 2 f'dry and 2 soft.....	44.00
Malleable Bessemer.....	44.00
Basic.....	44.00
Low-phosphorus.....	80.00
Silvery, 8 per cent.....	50.75
Bessemer ferrosilicon, 10 per cent.....	70.50

Ferroalloys.—Quotations for prompt 80 per cent ferromanganese range from \$425 to \$450 per ton, with material for delivery late in the year at \$400. A firm which has a limited stock in Chicago is offering standard 80 per cent lump ferromanganese at 20c. per pound, 75 per cent at 18c., and 70 per cent at 16c. It also has a small stock of standard 50 per cent ferrosilicon which it offers for immediate shipment at 15c. per pound, f.o.b. cars, Chicago. It offers one minimum carload of standard 50 per cent ferrosilicon for immediate delivery at \$290 per gross ton with freight allowed to Chicago, or points taking an equal freight rate, and a carload for June shipment at \$265. For 10 per cent Bessemer ferrosilicon, about \$70.54 is quoted.

Structural Material.—The leading interest continues to assert that it has no material to sell, and, therefore, has no price. From other sources, it is learned that 4.25c., Pittsburgh, or 4.439c., Chicago, might be considered for 1918 delivery while others consider 4.50c., Pittsburgh, or 4.659c., Chicago, as the minimum for any delivery, at the same time admitting they have nothing to sell. A project now up is a coliseum building at Fort Wayne, Ind. requiring 1000 tons, but in view of present costs it is doubtful whether action will be taken. The Consolidated Arizona Smelting Company, Humboldt,

Ala., has placed 423 tons for a roaster building, and 100 tons has been placed for a theater building for T. S. Martin at Sioux City, Iowa. The New York Central Lines are in the market for 1000 steel gondola cars.

We quote for Chicago delivery of structural steel out of jobbers' stocks, 5c.

Rails and Track Supplies.—No business is reported definitely, but there has been some quiet buying of late for 1918 delivery. On the other hand, one road in the West has announced that it will not buy any material which involves the necessity on its part of employing labor. A small tonnage of standard section rails brought \$65 at a point in Ohio.

Quotations are as follows: Standard railroad spikes, 4c. to 1.10c., base; small spikes, 4.25c. to 4.35c., base; track bolts with square nuts, 5c. to 5.10c., all in carloads, Chicago; tie plates, \$60 to \$70, f.o.b. mill, net ton; standard section Bessemer rails, Chicago, \$38, base; open hearth, \$40; light rails, 25 to 45 lb., \$60; 16 to 20 lb., \$61; 12 lb., \$62; 8 lb., \$63; angle bars, 2.75c., base.

Plates.—For indefinite delivery, 5.189c., Chicago, is reported to have been named, but for delivery inside of three months 6.689c. to 7.189c., Chicago, is quoted by mills whose range of sizes is limited. A few hundred tons were taken at 6.689c. for delivery any time this year. It also is true that a large consumer paid 7.189c. for several hundred tons of tank plates, and later 7.689c. for another lot, the latter price now being regularly quoted by the seller. Others have also sold at 7c. to 7.50c., Pittsburgh, for delivery under four months.

We quote for Chicago delivery of plates out of jobbers' stocks, 6.50c. to 7c.

Sheets.—With so many producers out of the market, sheet prices are difficult to figure. No. 28 galvanized ranges from 9c. to 10c., Pittsburgh, equivalent to 9.189c. to 10.189c., Chicago. Their manufacture is restricted by the high cost of black sheets, and their price puts them beyond the reach of many consumers. The minimum quoted for No. 28 black is 6.689c., Chicago, up to 7.439c. asked, the same prices applying to No. 10 blue annealed. Jobbers have advanced their quotations for galvanized out of stock \$10 per ton.

We quote for Chicago delivery out of stock, regardless of quantity, as follows: No. 10 blue annealed, 7c.; No. 28 black, 7.50c., and No. 28 galvanized, 9.50c.

Rivets and Bolts.—No developments of interest are reported in this field. Prices, both wholesale and jobbing, are unchanged.

Mill quotations are without change as follows: Carriage bolts up to $\frac{3}{4}$ x 6 in., rolled thread, 40; cut thread, 35-2 $\frac{1}{2}$; larger sizes, 25; machine bolts up to $\frac{3}{4}$ x 4 in., rolled thread, with hot-pressed square nuts, 40-10; cut thread, 40; large size, 30; gimlet-point coach screws, 45; hot-pressed nuts, square, \$2.10 off per 100 lb.; hexagon, \$1.90 off. Structural rivets, $\frac{3}{4}$ to 1 $\frac{1}{4}$ in., 4.75c. to 4.939c., base, Chicago, in carload lots; boiler rivets, 10c. additional.

Store prices are as follows: Structural rivets, 5c.; boiler rivets, 5.10c.; machine bolts up to $\frac{3}{4}$ x 4 in., 40-10; larger sizes, 35-5; carriage bolts up to $\frac{3}{4}$ x 6 in., 40-2 $\frac{1}{2}$; larger sizes, 30-5; hot-pressed nuts, square, \$3, and hexagon \$3 off per 100 lb.; lag screws, 50 per cent off.

Bars.—The minimum for mild steel bars is unchanged at 3.689c., Chicago, but for prompt delivery one mill asks a minimum of 4.189c., and does not care to sell unless this figure is met. High carbon bars are quoted at 3.50c., Chicago, and are firm at this level, the probabilities being that higher prices will soon be asked because of the active demand and the steadily advancing price of re-rolling rails. Iron bars also are at the 3.50c., Chicago, base.

We quote prices out of store for Chicago delivery as follows: Soft steel bars, 4.50c.; bar iron, 4c.; reinforcing bars, 4.50c., base, with 5c. extra for twisting in sizes $\frac{1}{2}$ in. and over and usual card extras for smaller sizes; shafting list plus 5 per cent to plus 10 per cent.

Cast-Iron Pipe.—Public lettings continue at a minimum rate. Toledo, Ohio, is to award 400 tons May 29, while Milwaukee will let 225 tons to-day.

Quotations are unchanged as follows, per net ton, Chicago: Water pipe, 4 in., \$58.50; 6 in. and larger, \$55.50, with \$1 extra for class A water pipe and gas pipe.

Wire Products.—Jobbers, as well as the independent makers, have advanced their quotations recently, but the leading interest adheres to its prices based on nails at \$3.20 per keg. Its position with respect to un-

filled tonnage is unchanged, and it states that the question of prices is therefore relatively unimportant. To jobbers it quotes as follows per 100 lb.:

Plain fence wire, Nos. 6 to 9, base, \$3.339; wire nails, \$3.389; painted barb wire, \$3.539; galvanized barb wire, \$4.239; polished staples, \$3.539; galvanized staples, \$4.239, all Chicago, carload lots.

Old Material.—The market is showing signs of increasing strength, much higher prices having been offered for several grades, for some of which higher prices have been paid. It appears that shipments, which were thought to be improving, are not large enough to keep consumers out of the market, and the situation is not helped by the car situation, especially that phase of it which makes shipping in gondola cars more difficult. Dealers are endeavoring to obtain some modification of the rule that gondola and hopper cars, when made empty, must be speedily returned to their home road, a requirement which was made effective to facilitate the movement of iron ore and coal. Small offerings were made in the week by the Chicago & Great Western, Michigan Central and Minneapolis, St. Paul and Sault Saint Marie. We quote for delivery at buyers' works, Chicago and vicinity, all freight and transfer charges paid, as follows:

	Per Gross Ton
Old iron rails	\$32.50 to \$33.50
Relaying rails	39.00 to 40.00
Old carwheels	25.50 to 26.00
Old steel rails, re-rolling	36.00 to 36.50
Old steel rails, less than 3 ft.	31.50 to 32.00
Heavy melting steel scrap	28.50 to 29.50
Frogs, switches and guards, cut apart	28.50 to 29.50
Shoveling steel	28.00 to 29.00
Steel axle turnings	17.50 to 18.00

	Per Net Ton
Iron angles and splice bars	\$34.50 to \$35.00
Iron arch bars and transoms	35.00 to 35.50
Steel angle bars	28.50 to 29.00
Iron car axles	41.50 to 42.50
Steel car axles	41.50 to 42.50
No. 1 railroad wrought	31.00 to 32.00
No. 2 railroad wrought	28.00 to 29.00
Cut forge	28.50 to 29.00
Pipes and flues	17.75 to 18.25
No. 1 busheling	21.50 to 22.50
No. 2 busheling	15.00 to 16.00
Steel knuckles and couplers	29.00 to 30.00
Steel springs	30.50 to 31.00
No. 1 boilers, cut to sheets and rings	18.00 to 18.50
Boiler punchings	24.00 to 24.50
Locomotive tires, smooth	38.00 to 38.50
Machine-shop turnings	11.50 to 12.00
Cast borings	11.50 to 12.00
No. 1 cast scrap	22.00 to 23.00
Stove plate and light cast scrap	15.00 to 15.50
Grate bars	15.00 to 15.50
Brake shoes	15.00 to 15.50
Railroad malleable	22.00 to 22.50
Agricultural malleable	18.50 to 19.00

Philadelphia

PHILADELPHIA, PA., May 14, 1917.

Certain Government requirements for plates and shapes have been indicated to eastern Pennsylvania mills during the past week, but no specifications are noted. In one instance, a large independent interest was notified of the desire of the Navy Department that the mill take on about 10,000 tons of plates and shapes to be considered as a portion of its allotment of war requirements. The Department was promptly notified that the mill only awaits specifications to begin rolling. This particular tonnage, it is understood, is wanted for construction work at the League Island and Norfolk navy yards. Government specifications on plates and sheets for light ordnance work, including the manufacture of torpedo heads, cartridge cases, powder cans, mines, artillery wheels and other similar military supplies, are running into heavy tonnage, one Eastern mill reporting that about 3000 tons of sheets and shapes have been scheduled for early deliveries to large Eastern machine shops. Mills generally are awaiting more definite developments with respect to war allotments. In the case of the plate makers, the policy appears to be one of reserving space while the structural mills will simply schedule Government specifications as fast as received ahead of everything else.

Pig Iron.—Very little pig iron is being offered in this market for prompt shipment. Sales of small lots of eastern Pennsylvania foundry iron were made during the week for last-half deliveries on a basis of \$43.50,

furnace, for No. 2 X, while for prompt shipment one seller booked orders on several lots of 200 and 300 tons at \$44, furnace, for No. 2 X. In still another quarter \$44.50, Philadelphia, was done on a fair tonnage for shipment over the remainder of the year. Buying of first-half iron continues active and some eastern Pennsylvania foundry grades have been sold at widely ranging prices. Several sellers report moving carlots of iron a few points off in sulphur at very good prices for prompt shipment. In the case of one Pennsylvania furnace \$44 was done on two cars of off-iron, and a Virginia interest sold about 700 tons at \$43, the price in each instance including delivery charges. The Virginia Iron, Coal & Coke Company remains out of the market and the Virginia interest which opened its books last week for first half on a basis of \$38, furnace, for No. 2 X and \$37.75 for No. 2 has withdrawn after booking around 15,000 tons in three days. As far as can be learned, only one Virginia furnace is now offering anything and \$45 is being asked for all grades for prompt and last-half shipments. Small tonnages of Virginia No. 2 X have been sold at \$45, furnace. No two furnaces have the same ideas, which makes appraisal of the price situation exceedingly difficult. A large Alabama interest has nothing to sell; another Southern agency quotes \$40, Birmingham, for spot No. 2 iron, but no sales are noted. There has been considerable inquiry for standard low-phosphorus, standard Bessemer and No. 1 foundry iron for export with few sellers reported as interested. The market is pretty well cleaned up on low-phosphorus iron; and what is to be had is bringing up to \$80 at the furnace. There has been no movement of basic for some time. Quotations for standard brands delivered in buyers' yards for prompt shipment range about as follows:

Eastern Pa. No. 2 X foundry.....	\$43.50 to \$44.50
Eastern Pa. No. 2 plain.....	43.00 to 44.00
Virginia No. 2 X foundry.....	43.00 to 44.00
Virginia No. 2 plain.....	42.50 to 43.50
Gray forge	39.75 to 42.50
Basic	38.00 to 40.00
Standard low-phosphorus	78.00 to 80.00

Ferroalloys.—There is considerable inquiry for ferromanganese and ferrosilicon for prompt deliveries, but supplies are negligible and the market is very uncertain. It is reported that the British Government is now allowing licenses to consumers other than those actually engaged on munitions contracts for the Allies and the situation is expected to become easier soon, although exactly how much English alloy will be released and how soon the mills will benefit are matters about which none seems informed. Usual quotations on domestic ferromanganese are from \$400 to \$450 for prompt shipment. One sale of 100 tons is noted on a basis of \$440, furnace. Demand for spot material in both 50 per cent and blast-furnace ferrosilicon is reported to have met but scant offerings and prices are not given.

Structural Material.—Few building jobs are coming in the market, the base price of steel being held accountable to a great extent for this condition. Mills continue to turn away big business on the plea that schedules are full and it is now impossible to name any deliveries. The minimum price among independents for standard shapes is still 4½c., base, with an occasional special order bringing out a quotation of 5c. and up, although generally the mills refuse to handle any and all new specifications, regardless of premiums offered.

Plates.—Leading independents have advanced the minimum price for tank steel to 7.50c., a jump of \$10 a ton above previous ruling quotations. One mill now quotes 9.50c. to 10c. as its base price for ship plates, with other grades in proportion, and quotes 17c., base, and upward for marine boiler steel. Another independent quotes 16.059c., Philadelphia, as its minimum for marine steel. These prices have been shaded only in transactions of a special nature, such as the sale of several hundred tons by one interest where the mill is restricted to odd-sized rollings, in which case 7¼c., tank base, was done. Persistent demands on the part of large buyers have gone into first half of 1918, but mills consistently refuse to quote on anything beyond July 1. Such is the present congestion at eastern Penn-

sylvania plants that from 9 to 12 months, depending on the character of the specifications, represent earliest shipments.

Billets.—Few mills have anything to sell. One independent has advanced its minimum to \$90 on open-hearth rerolling billets and \$110 is the usual quotation for forging billets. About 8000 tons of slabs were offered for spot deliveries on a basis of \$85, mill, and it is understood a small tonnage was moved at this figure.

Sheets.—Government requirements are an outstanding feature of the market for sheets and a large tonnage of blue annealed, No. 16 gage to 3/16 in., has been taken by one mill for early shipment to points where war contracts are in progress. Sellers are mostly cleaned up on sheets for prompt and last-half shipment, and the market is very strong on a basis of 7c. to 7½c. for No. 10 blue annealed.

Coke.—Further strengthening in the market is reported by sellers of foundry coke and usual quotations are now \$10 for spot and \$9.50 to \$10 for shipment over the last half of this year.

Old Material.—The market may be said to be quiet with business for the most part between brokers. New strength is reported with respect to cast scrap, and grades which come in competition with pig iron, and usual quotations are now \$29 to \$30. Railroad wrought and substitutes continue in good demand. In some quarters railroad malleable is being quoted at \$4 a ton advance over last week's list. Possibility of the railroads restricting the number of cars for scrap loading is injecting a bullish undertone to the market. Quotations covering eastern Pennsylvania and taking freight rates from 35c. to \$1.35 per gross ton, are about as follows:

No. 1 heavy melting steel.....	\$25.00 to \$26.00
Old steel rails, rerolling	34.00 to 35.00
Low-phosphorus heavy melting steel	
scrap	38.00 to 40.00
Old iron and steel axles (for export) ..	47.00 to 48.00
Old iron rails	34.00 to 35.00
Old carwheels	27.00 to 28.00
No. 1 railroad wrought	41.00 to 42.00
No. 1 forge fire	19.00 to 19.50
Bundled sheets	19.00 to 19.50
No. 2 busheling	16.00 to 16.50
Machine-shop turnings	16.00 to 16.50
Cast borings	16.00 to 16.50
No. 1 cast	29.00 to 30.00
Grate bars, railroad	18.00 to 19.00
Stove plate	18.50 to 19.00
Railroad malleable	27.00 to 28.00

Cleveland

CLEVELAND, OHIO, May 15, 1917.

Iron Ore.—Ore is moving fairly well this week, ice conditions having improved in Lake Superior, but shipments are below the schedule, and the May movement will show a heavy falling off from that of last year. Shippers who some time ago predicted that the 1917 movement would not reach that of 1916 are now very confident that their prediction will prove true. A number of ore boats suffered minor injuries by being caught in the ice in Lake Superior, and the time required for their repair will tend to reduce shipment during the next few weeks. Some shippers are in the market for season contracts, but little vessel tonnage is available. No sales are reported. We quote prices as follows, delivered lower Lake ports: Old range Bessemer, \$5.95; Mesaba Bessemer, \$5.70; old range non-Bessemer, \$5.20; Mesaba Bessemer, \$5.05.

Pig Iron.—The demand for both steel-making and foundry iron is less active than it has been for some time, and there has been no further advance in prices during the week. Very little iron is available for the remainder of the year, and one selling agency that has been trying for several days to secure some iron for that delivery for its trade has not yet succeeded in finding the iron. Of two Cleveland producers, only one has been selling iron for some time, and this interest is not now quoting prices, although it is getting many inquiries. The market continues active in the Michigan

and Indiana territory. We note the sale of a 2000-ton lot and a 1000-ton lot of malleable iron for shipment during the first half of next year from Chicago to Indiana consumers, 2000 tons of malleable iron for delivery in Michigan during the first half, and two lots of 500 tons each of malleable to Ohio and Michigan consumers. A Lake furnace has sold 2000 tons of malleable for the first half and 1000 tons for the last quarter for delivery in the Pittsburgh district. Foundry iron is quoted by Cleveland and other Lake furnaces at a minimum price of \$43 for No. 2 for this year's delivery, and \$41 for the first half of next year. Malleable iron is quoted at \$42 for this year and \$40 for the first half of next year. Among new inquiries is one from the Ohio Mold & Foundry Company, Cincinnati, for 5000 tons of basic, Bessemer and malleable iron for the last half. Ohio silvery iron is about \$1 per ton higher, sales having been made at \$52 for 8 per cent silicon for both the last-half and first-half delivery. We quote, delivered Cleveland, as follows:

Bessemer	\$44.95
Basic	42.30
Northern No. 2 foundry	\$41.30 to 43.30
Southern No. 2 foundry	40.00 to 42.00
Gray forge	40.95
Ohio silvery, 8 per cent silicon	51.62 to 53.62
Standard low phos., Valley furnace	70.00 to 75.00

Coke.—Producers are well sold up, and several are no longer taking contracts for foundry coke for the last half. Standard Connellsville foundry coke is quoted at \$8.50 to \$9 per net ton at oven for contracts and \$9.50 for prompt shipment.

Bolts, Nuts and Rivets.—Inquiry for bolt and nut contracts for the third quarter is heavy, but manufacturers are trying to avoid making contracts for that delivery as far as possible, because they have not yet been able to secure wire and fuel oil prices for that delivery. The demand from shipyards is heavy and a large volume of business is coming from the Government. Rivet specifications are coming out in good volume. We quote rivets at 4.75c., Pittsburgh, for structural and 4.85c. for boiler rivets for delivery before July 1, the price for third quarter contracts being \$3 a ton higher. Bolt and nuts discounts are as follows:

Common carriage bolts, $\frac{3}{4}$ x 6 in., smaller or shorter, rolled thread, 40 off; cut thread, 35 and 2½; larger or longer, 25. Machine bolts, with h. p. nuts $\frac{3}{4}$ x 4 in., smaller or shorter, rolled thread, 40 and 10; cut thread, 40; larger and longer, 30. Lag bolts, cone point, 45. Square h. p. nuts, blank, \$2.10 off list; tapped, \$1.90 off list. Hexagon, h. p. nuts, blank, \$1.90 off; tapped, \$1.70 off. C. p. c. and t. hexagon nuts, all sizes, blank, \$1.60 off; tapped, \$1.40 off. Cold pressed semi-finished hexagon nuts, 50 and 10 off.

Finished Iron and Steel.—There is a good volume of inquiry for small lots of steel for whatever deliveries mills are able to make. So far there is not much demand for steel in this territory for Government requirements, the only new order for Government work reported being for 3000 tons of plates for boilers placed with a Cleveland shop by the Washington Steel & Ordnance Company. The French inquiry for 21,000 tons of light rails, which has been pending for several weeks, is expected to result in the placing of the order this week. Anxiety and uncertainty as to their car supply have been caused among the Cleveland mills and blast furnace interests owing to the issuance of the preferential freight lists by the Government Railroad Board, this being due to the omission of pig iron and steel from this list. The manufacturers claim that unless a modification is made their available car supply will be reduced to 20 per cent of what they have been furnished. The demand for semi-finished steel is active. A Cleveland mill has sold 2000 tons of open-hearth sheet bars at \$100 for prompt shipment and has declined offers of the same price for the third quarter. A Cleveland consumer has purchased 1000 tons of Bessemer sheet bars from a Pittsburgh district mill at \$90 for July delivery. There is some feeling that the war situation will cause a decrease in the automobile production, but there is no indication of this so far in the volume of specifications that the mills are getting from the automobile plants, as these continue heavy. Some inquiry has come from the agricultural implement trade for contracts for the first half of 1918, but these are not being considered.

In structural lines the King Bridge Company, Cleveland, was the only bidder for the convention hall to be erected in Cleveland, requiring about 3250 tons of steel. This company's bid was approximately \$178 a ton for the steel fabricated and erected, and it asked for 600 days to complete the work. Plates are very firm and are being quoted at 7.50c. to 8c., Cleveland. One Pittsburgh district mill has advanced its price to 7.50c. on plates and 4.50c. on structural material. Bar iron is quiet and firm at 3.50c., Cleveland. Hard steel bars are quoted at 3.15c. to 3.25c. at mill. We note the sale of 1000 tons for shipment East at the latter price. Sheets continue in heavy demand and prices are firm at 7c. to 7.50c. for No. 28 black; 6.75c. to 7.50c. for No. 10 blue annealed and 9c. to 10c. for No. 28 galvanized. Warehouse prices are unchanged at 4.50c. for steel bars, 5c. for structural material, 7c. for plates and 7c. for blue annealed sheets.

Old Material.—The market is firm, but on the whole quiet, although there is a very active demand from foundries for cast scrap, and borings and turnings are moving freely, transactions in the latter grades being largely between dealers. Cast scrap is about \$1 a ton higher and turnings have been marked up slightly. Sales of stove plate were made during the week at \$16.50, but as high as \$17.50 is now being asked. Railroad wrought sold by the Michigan Central Railroad last week is understood to have brought \$38.65 gross. We quote, f.o.b. Cleveland, as follows:

Per Gross Ton	
Steel rails	\$26.50 to \$27.00
Steel rails, rerolling	36.00 to 37.00
Steel rails under 3 ft.	31.00 to 32.00
Iron rails	33.00 to 34.00
Steel car axles	45.00 to 47.00
Heavy melting steel	27.50 to 28.00
Carwheels	23.50 to 24.00
Relaying rails, 50 lb. and over	37.00 to 38.00
Agricultural malleable	18.50 to 19.00
Railroad malleable	24.00 to 25.00
Light bundled sheet scrap	17.75 to 18.50
Per Net Ton	
Iron car axles	\$46.00 to \$47.00
Cast borings	11.75 to 12.25
Iron and steel turnings and drillings	11.25 to 11.75
No. 1 busheling	21.00 to 22.00
No. 1 railroad wrought	32.00 to 32.50
No. 1 cast	23.00 to 24.00
Railroad grate bars	16.50 to 17.00
Stove plate	16.50 to 17.00

Cincinnati

CINCINNATI, OHIO, May 15, 1917.

Pig Iron.—There is a constantly increasing pressure by buyers for deliveries on old contracts and also for new contracting. A great deal more iron has been purchased quietly for shipment in the first half of next year than is generally realized and some of the furnaces are now becoming more reluctant to take on much business at the minimum prices quoted. Southern iron for prompt shipment is now obtainable at \$40, Birmingham only, but for strictly last quarter delivery this price can be shaded about \$2 with some interests. Quotations for the first half of next year range all the way from \$36 to \$40, Birmingham basis, but no sales have been made at the last-named price for that delivery. Northern foundry has been advanced to \$43, Ironton, for prompt shipment and is quoted around \$40 to \$42 for shipment in the first half of next year. Basic and malleable are both firm on the same basis. Buying of foundry iron in the past few days has been confined mostly to small lots, but the total tonnage runs the average up to a respectable figure. Indiana melters have lately bought quite freely for shipment in the first half of 1918. The Ohio silvery irons are very scarce for this year's shipment and quotable figures are hard to obtain. However, for the first half of next year, 8 per cent iron is bringing \$50 at furnace. The general open inquiry for all kinds of iron is light, but the quiet business under negotiation is heavy. Only a few sales of Virginia iron have been made in this territory in the past few days.

Finished Material.—The warehouse price on No. 10 blue annealed sheets has been advanced to 7.50c. and the mill quotation to-day on No. 28 black sheets is 7.65c. and on No. 28 galvanized 9.65c., f.o.b. cars.

furnace, for No. 2 X, while for prompt shipment one seller booked orders on several lots of 200 and 300 tons at \$44, furnace, for No. 2 X. In still another quarter \$44.50, Philadelphia, was done on a fair tonnage for shipment over the remainder of the year. Buying of first-half iron continues active and some eastern Pennsylvania foundry grades have been sold at widely ranging prices. Several sellers report moving carlots of iron a few points off in sulphur at very good prices for prompt shipment. In the case of one Pennsylvania furnace \$44 was done on two cars of off-iron, and a Virginia interest sold about 700 tons at \$43, the price in each instance including delivery charges. The Virginia Iron, Coal & Coke Company remains out of the market and the Virginia interest which opened its books last week for first half on a basis of \$38, furnace, for No. 2 X and \$37.75 for No. 2 has withdrawn after booking around 15,000 tons in three days. As far as can be learned, only one Virginia furnace is now offering anything and \$45 is being asked for all grades for prompt and last-half shipments. Small tonnages of Virginia No. 2 X have been sold at \$45, furnace. No two furnaces have the same ideas, which makes appraisal of the price situation exceedingly difficult. A large Alabama interest has nothing to sell; another Southern agency quotes \$40, Birmingham, for spot No. 2 iron, but no sales are noted. There has been considerable inquiry for standard low-phosphorus, standard Bessemer and No. 1 foundry iron for export with few sellers reported as interested. The market is pretty well cleaned up on low-phosphorus iron; and what is to be had is bringing up to \$80 at the furnace. There has been no movement of basic for some time. Quotations for standard brands delivered in buyers' yards for prompt shipment range about as follows:

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Eastern Pa. No. 2 plain.....	43.00 to 44.00
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Virginia No. 2 plain.....	42.50 to 43.50
Gray forge	39.75 to 42.50
Basic	38.00 to 40.00
Standard low-phosphorus	78.00 to 80.00

Ferroalloys.—There is considerable inquiry for ferromanganese and ferrosilicon for prompt deliveries, but supplies are negligible and the market is very uncertain. It is reported that the British Government is now allowing licenses to consumers other than those actually engaged on munitions contracts for the Allies and the situation is expected to become easier soon, although exactly how much English alloy will be released and how soon the mills will benefit are matters about which none seems informed. Usual quotations on domestic ferromanganese are from \$400 to \$450 for prompt shipment. One sale of 100 tons is noted on a basis of \$440, furnace. Demand for spot material in both 50 per cent and blast-furnace ferrosilicon is reported to have met but scant offerings and prices are not given.

Structural Material.—Few building jobs are coming in the market, the base price of steel being held accountable to a great extent for this condition. Mills continue to turn away big business on the plea that schedules are full and it is now impossible to name any deliveries. The minimum price among independents for standard shapes is still $4\frac{1}{2}$ c., base, with an occasional special order bringing out a quotation of 5c. and up, although generally the mills refuse to handle any and all new specifications, regardless of premiums offered.

Plates.—Leading independents have advanced the minimum price for tank steel to 7.50c., a jump of \$10 a ton above previous ruling quotations. One mill now quotes 9.50c. to 10c. as its base price for ship plates, with other grades in proportion, and quotes 17c., base, and upward for marine boiler steel. Another independent quotes 16.059c., Philadelphia, as its minimum for marine steel. These prices have been shaded only in transactions of a special nature, such as the sale of several hundred tons by one interest where the mill is restricted to odd-sized rollings, in which case $7\frac{1}{4}$ c., tank base, was done. Persistent demands on the part of large buyers have gone into first half of 1918, but mills consistently refuse to quote on anything beyond July 1. Such is the present congestion at eastern Penn-

sylvania plants that from 9 to 12 months, depending on the character of the specifications, represent earliest shipments.

Billets.—Few mills have anything to sell. One independent has advanced its minimum to \$90 on open-hearth rerolling billets and \$110 is the usual quotation for forging billets. About 8000 tons of slabs were offered for spot deliveries on a basis of \$85, mill, and it is understood a small tonnage was moved at this figure.

Sheets.—Government requirements are an outstanding feature of the market for sheets and a large tonnage of blue annealed, No. 16 gage to 3/16 in., has been taken by one mill for early shipment to points where war contracts are in progress. Sellers are mostly cleaned up on sheets for prompt and last-half shipment, and the market is very strong on a basis of 7c. to $7\frac{1}{2}$ c. for No. 10 blue annealed.

Coke.—Further strengthening in the market is reported by sellers of foundry coke and usual quotations are now \$10 for spot and \$9.50 to \$10 for shipment over the last half of this year.

Old Material.—The market may be said to be quiet with business for the most part between brokers. New strength is reported with respect to cast scrap, and grades which come in competition with pig iron, and usual quotations are now \$29 to \$30. Railroad wrought and substitutes continue in good demand. In some quarters railroad malleable is being quoted at \$4 a ton advance over last week's list. Possibility of the railroads restricting the number of cars for scrap loading is injecting a bullish undertone to the market. Quotations covering eastern Pennsylvania and taking freight rates from 35c. to \$1.35 per gross ton, are about as follows:

No. 1 heavy melting steel.....	\$25.00 to \$26.00
Old steel rails, rerolling	34.00 to 35.00
Low-phosphorus heavy melting steel	
scrap	38.00 to 40.00
Old iron and steel axles (for export) ..	47.00 to 48.00
Old iron rails	34.00 to 35.00
Old carwheels	27.00 to 28.00
No. 1 railroad wrought	41.00 to 42.00
No. 1 forge fire.....	19.00 to 19.50
Bundled sheets	19.00 to 19.50
No. 2 busheling	16.00 to 16.50
Machine-shop turnings	16.00 to 16.50
Cast borings	16.00 to 16.50
No. 1 cast	29.00 to 30.00
Grate bars, railroad	18.00 to 19.00
Stove plate	18.50 to 19.00
Railroad malleable	27.00 to 28.00

Cleveland

CLEVELAND, OHIO, May 15, 1917.

Iron Ore.—Ore is moving fairly well this week, ice conditions having improved in Lake Superior, but shipments are below the schedule, and the May movement will show a heavy falling off from that of last year. Shippers who some time ago predicted that the 1917 movement would not reach that of 1916 are now very confident that their prediction will prove true. A number of ore boats suffered minor injuries by being caught in the ice in Lake Superior, and the time required for their repair will tend to reduce shipment during the next few weeks. Some shippers are in the market for season contracts, but little vessel tonnage is available. No sales are reported. We quote prices as follows, delivered lower Lake ports: Old range Bessemer, \$5.95; Mesaba Bessemer, \$5.70; old range non-Bessemer, \$5.20; Mesaba Bessemer, \$5.05.

Pig Iron.—The demand for both steel-making and foundry iron is less active than it has been for some time, and there has been no further advance in prices during the week. Very little iron is available for the remainder of the year, and one selling agency that has been trying for several days to secure some iron for that delivery for its trade has not yet succeeded in finding the iron. Of two Cleveland producers, only one has been selling iron for some time, and this interest is not now quoting prices, although it is getting many inquiries. The market continues active in the Michigan

and Indiana territory. We note the sale of a 2000-ton lot and a 1000-ton lot of malleable iron for shipment during the first half of next year from Chicago to Indiana consumers, 2000 tons of malleable iron for delivery in Michigan during the first half, and two lots of 500 tons each of malleable to Ohio and Michigan consumers. A Lake furnace has sold 2000 tons of malleable for the first half and 1000 tons for the last quarter for delivery in the Pittsburgh district. Foundry iron is quoted by Cleveland and other Lake furnaces at a minimum price of \$43 for No. 2 for this year's delivery, and \$41 for the first half of next year. Malleable iron is quoted at \$42 for this year and \$40 for the first half of next year. Among new inquiries is one from the Ohio Mold & Foundry Company, Cincinnati, for 5000 tons of basic, Bessemer and malleable iron for the last half. Ohio silvery iron is about \$1 per ton higher, sales having been made at \$52 for 8 per cent silicon for both the last-half and first-half delivery. We quote, delivered Cleveland, as follows:

Bessemer	\$44.95
Basic	42.30
Northern No. 2 foundry.....	\$41.30 to 43.30
Southern No. 2 foundry.....	40.00 to 42.00
Gray forge	40.95
Ohio silvery, 8 per cent silicon.....	51.62 to 53.62
Standard low phos., Valley furnace...	70.00 to 75.00

Coke.—Producers are well sold up, and several are no longer taking contracts for foundry coke for the last half. Standard Connellsville foundry coke is quoted at \$8.50 to \$9 per net ton at oven for contracts and \$9.50 for prompt shipment.

Bolts, Nuts and Rivets.—Inquiry for bolt and nut contracts for the third quarter is heavy, but manufacturers are trying to avoid making contracts for that delivery as far as possible, because they have not yet been able to secure wire and fuel oil prices for that delivery. The demand from shipyards is heavy and a large volume of business is coming from the Government. Rivet specifications are coming out in good volume. We quote rivets at 4.75c., Pittsburgh, for structural and 4.85c. for boiler rivets for delivery before July 1, the price for third quarter contracts being \$3 a ton higher. Bolt and nuts discounts are as follows:

Common carriage bolts, $\frac{3}{4}$ x 6 in., smaller or shorter, rolled thread, 40 off; cut thread, 35 and 2 $\frac{1}{2}$; larger or longer, 25. Machine bolts, with h. p. nuts $\frac{3}{4}$ x 4 in., smaller or shorter, rolled thread, 40 and 10; cut thread, 40; larger and longer, 30. Lag bolts, cone point, 45. Square h. p. nuts, blank, \$2.10 off list; tapped, \$1.90 off list. Hexagon, h. p. nuts, blank, \$1.90 off; tapped, \$1.70 off. C. p. c. and t. hexagon nuts, all sizes, blank, \$1.60 off; tapped, \$1.40 off. Cold pressed semi-finished hexagon nuts, 50 and 10 off.

Finished Iron and Steel.—There is a good volume of inquiry for small lots of steel for whatever deliveries mills are able to make. So far there is not much demand for steel in this territory for Government requirements, the only new order for Government work reported being for 3000 tons of plates for boilers placed with a Cleveland shop by the Washington Steel & Ordnance Company. The French inquiry for 21,000 tons of light rails, which has been pending for several weeks, is expected to result in the placing of the order this week. Anxiety and uncertainty as to their car supply have been caused among the Cleveland mills and blast furnace interests owing to the issuance of the preferential freight lists by the Government Railroad Board, this being due to the omission of pig iron and steel from this list. The manufacturers claim that unless a modification is made their available car supply will be reduced to 20 per cent of what they have been furnished. The demand for semi-finished steel is active. A Cleveland mill has sold 2000 tons of open-hearth sheet bars at \$100 for prompt shipment and has declined offers of the same price for the third quarter. A Cleveland consumer has purchased 1000 tons of Bessemer sheet bars from a Pittsburgh district mill at \$90 for July delivery. There is some feeling that the war situation will cause a decrease in the automobile production, but there is no indication of this so far in the volume of specifications that the mills are getting from the automobile plants, as these continue heavy. Some inquiry has come from the agricultural implement trade for contracts for the first half of 1918, but these are not being considered.

In structural lines the King Bridge Company, Cleveland, was the only bidder for the convention hall to be erected in Cleveland, requiring about 3250 tons of steel. This company's bid was approximately \$178 a ton for the steel fabricated and erected, and it asked for 600 days to complete the work. Plates are very firm and are being quoted at 7.50c. to 8c., Cleveland. One Pittsburgh district mill has advanced its price to 7.50c. on plates and 4.50c. on structural material. Bar iron is quiet and firm at 3.50c., Cleveland. Hard steel bars are quoted at 3.15c. to 3.25c. at mill. We note the sale of 1000 tons for shipment East at the latter price. Sheets continue in heavy demand and prices are firm at 7c. to 7.50c. for No. 28 black; 6.75c. to 7.50c. for No. 10 blue annealed and 9c. to 10c. for No. 28 galvanized. Warehouse prices are unchanged at 4.50c. for steel bars, 5c. for structural material, 7c. for plates and 7c. for blue annealed sheets.

Old Material.—The market is firm, but on the whole quiet, although there is a very active demand from foundries for cast scrap, and borings and turnings are moving freely, transactions in the latter grades being largely between dealers. Cast scrap is about \$1 a ton higher and turnings have been marked up slightly. Sales of stove plate were made during the week at \$16.50, but as high as \$17.50 is now being asked. Railroad wrought sold by the Michigan Central Railroad last week is understood to have brought \$38.65 gross. We quote, f.o.b. Cleveland, as follows:

Per Gross Ton	
Steel rails	\$26.50 to \$27.00
Steel rails, rerolling	36.00 to 37.00
Steel rails under 3 ft.	31.00 to 32.00
Iron rails	33.00 to 34.00
Steel car axles	45.00 to 47.00
Heavy melting steel	27.50 to 28.00
Carwheels	23.50 to 24.00
Relaying rails, 50 lb. and over.....	37.00 to 38.00
Agricultural malleable	18.50 to 19.00
Railroad malleable	24.00 to 25.00
Light bundled sheet scrap	17.75 to 18.50
Per Net Ton	
Iron car axles	\$46.00 to \$47.00
Cast borings	11.75 to 12.25
Iron and steel turnings and drillings.....	11.25 to 11.75
No. 1 busheling	21.00 to 22.00
No. 1 railroad wrought	32.00 to 32.50
No. 1 cast	23.00 to 24.00
Railroad grate bars	16.50 to 17.00
Stove plate	16.50 to 17.00

Cincinnati

CINCINNATI, OHIO, May 15, 1917.

Pig Iron.—There is a constantly increasing pressure by buyers for deliveries on old contracts and also for new contracting. A great deal more iron has been purchased quietly for shipment in the first half of next year than is generally realized and some of the furnaces are now becoming more reluctant to take on much business at the minimum prices quoted. Southern iron for prompt shipment is now obtainable at \$40, Birmingham only, but for strictly last quarter delivery this price can be shaded about \$2 with some interests. Quotations for the first half of next year range all the way from \$36 to \$40, Birmingham basis, but no sales have been made at the last-named price for that delivery. Northern foundry has been advanced to \$43, Ironton, for prompt shipment and is quoted around \$40 to \$42 for shipment in the first half of next year. Basic and malleable are both firm on the same basis. Buying of foundry iron in the past few days has been confined mostly to small lots, but the total tonnage runs the average up to a respectable figure. Indiana melters have lately bought quite freely for shipment in the first half of 1918. The Ohio silvery irons are very scarce for this year's shipment and quotable figures are hard to obtain. However, for the first half of next year, 8 per cent iron is bringing \$50 at furnace. The general open inquiry for all kinds of iron is light, but the quiet business under negotiation is heavy. Only a few sales of Virginia iron have been made in this territory in the past few days.

Finished Material.—The warehouse price on No. 10 blue annealed sheets has been advanced to 7.50c. and the mill quotation to-day on No. 28 black sheets is 7.65c. and on No. 28 galvanized 9.65c., f.o.b. cars.

Cincinnati or Newport, Ky. These are the only advances that have been made in the past few days, but other quotations are very firm. Jobbers report a very good business in all lines and lately there has been a call for reinforcing concrete bars in excess of the supply. Hoops and bands are also in good demand and the mills are hard put to fill customers' requirements on time.

We quote store prices as follows: Steel bars, 4.65c.; twisted steel bars, 4.70c.; structural shapes, 5c.; $\frac{3}{4}$ in. plates and heavier, 7c.; machine bolts, $\frac{3}{4}$ x 4 in. and smaller, 50 per cent discount, larger and longer, 30 and 10 per cent discount; set screws, 45 per cent discount; files, 50 and 10 per cent discount and hack saws 10 per cent discount. Wire nails have been advanced by jobbers to \$3.90 per keg base and barb wire is firm at \$4.95 per 100 lb.

Coke.—Foundry coke is a little more active and prices are a trifle firmer in the Connellsville district. All the way from \$9.50 to \$10.50 per net ton at oven is quoted for nearby shipment and from \$9 to \$9.50 on contract business. Furnace coke for either prompt or future shipment ranges from \$7.75 to \$8 at oven. In the Wise County field, 72-hr. coke is bringing for prompt shipment \$12 per net ton and the contract price averages about \$10. This same condition exists in the Pocahontas field, but there are not very many contracts being placed at the present time. The car situation is giving some trouble and has not cleared up to any considerable extent.

Old Material.—A general advance of approximately 50c. a ton has been made on all grades of scrap. It is reported that Eastern consumers are placing orders for scrap to be moved promptly in anticipation of an advance in freight rates, and this doubtless has had some effect in bringing out the heavy buying on the part of the steel firms. The following are dealers' prices, f.o.b. at yards, southern Ohio and Cincinnati.

Per Gross Ton	
Bundled sheet scrap.....	\$17.50 to \$18.50
Old iron rails.....	26.50 to 27.50
Relaying rails, 50 lb. and up.....	31.00 to 31.50
Rerolling steel rails.....	30.50 to 31.00
Heavy melting steel rails.....	24.00 to 24.50
Steel rails for melting.....	23.00 to 23.50
Old carwheels.....	23.00 to 23.50

Per Net Ton	
No. 1 railroad wrought.....	\$26.00 to \$26.50
Cast borings.....	8.50 to 9.00
Steel turnings.....	8.50 to 9.00
Railroad cast.....	20.00 to 20.50
No. 1 machinery cast.....	20.50 to 21.50
Burnt scrap.....	12.00 to 12.50
Iron axles.....	34.00 to 34.50
Locomotive tires (smooth inside).....	34.50 to 35.50
Pipes and flues.....	15.00 to 15.50
Malleable cast.....	17.00 to 17.50
Railroad tank and sheet.....	15.50 to 16.00

Birmingham

BIRMINGHAM, ALA., May 15, 1917.

Pig Iron.—Furnace iron hardened during the week ending May 12 to very nearly a minimum of \$38 for last half, especially last quarter, and \$36 for the first half of 1918. As for spot iron, it is extremely difficult to obtain, and anywhere from \$37 to \$40 has been recently paid. An illustration of the character of the week's business is afforded by one furnace interest, which sold a lot for 1918 delivery, on which there had been prior arrangement, at \$35 per ton, followed immediately by another sale for same delivery at \$36. For last quarter of 1917 this interest sold lots at \$36, and \$37 and 600 tons at \$38, the last-named booking being made about May 10. These deals, summarized, read \$36 for 1918 and \$38 for 1917 delivery when the week closed. Agents of the same concern in the East secured 50c. better prices in several instances for 1917 delivery. The leading foundry interest, which was selling for 1918 early in the week at \$35, jumped quotations toward the end of the week to \$40 for the rest of this year, and \$36 for 1918 delivery. The leading interest is out of spot, continues to charge \$36 for 1918 delivery, and its last half price is \$38. One of the smaller concerns sold two lots of spot special analysis iron at \$40 and \$41.50 in the Chicago district for last half. This grade represents around \$37 and \$38 regular foundry. When this spot metal was put on the market by wire, offers for it on the part of consumers varied as much as \$3 per ton, evidencing a wide dis-

parity of sentiment as to prices. In Birmingham this week a furnace company, which sold a customer its own furnace iron at \$38, on special request of that customer secured additional iron for this customer from warrant yards at \$39. Thus the superior iron brought a lower price than the inferior, the latter having been gotten through a broker. Brokerage pig brings on an average \$1 per ton over furnace iron, the furnace operators not being as quick to charge the highest obtainable price. Car service is still bad and the negro exodus continues at a rate that has finally become alarming. Not only have hordes of experienced negroes gone North, but there is developing a scarcity even of raw hands. Operators contemplate drastic measures to stop it. We quote, per gross ton, f.o.b. Birmingham district furnaces, for any nearby delivery (with \$35 to \$36 for 1918), as follows:

No. 1 foundry and soft.....	\$38.50 to \$39.50
No. 2 foundry and soft.....	38.00 to 39.00
No. 3 foundry.....	37.50 to 38.50
No. 4 foundry.....	37.25 to 38.25
Gray forge.....	37.00 to 38.00
Basic.....	38.00 to 39.00
Charcoal.....	40.00 to 42.00

Bars.—Steel bars, in carload lots, f.o.b. Birmingham, 3.75c. to 4c.; iron bars, 3.50c. to 3.75c.

Cast-Iron Pipe.—While there is a continued hold-back of specifications on account of price advances, the large Argentine order, supplemented by fill-in contracts, keeps the leading interest busy on water pipe, and flange pipe for the oil fields is also in continuous demand. Output is the equivalent of cars offered. We quote, per net ton, f.o.b. Birmingham district shops, as follows: 4 in., \$53; 6 in. and upward, \$50, with \$1 added for gas pipe and special lengths.

Coal and Coke.—Coal and coke are featured more by difficulty in getting cars than by prices. Dealers are satisfied with prices, but the labor supply is becoming an acute proposition with the constant Northern exodus. Spot milling steam coal is around a minimum of \$3.50, with blacksmithing at \$5 and \$6.

Standard beehive coke brings \$14 for spot and \$12 on contracts as an average, with prices higher in some instances. Furnace coke is hardening at a minimum of \$8 per ton.

Old Material.—All kinds of cast scrap have stiffened in price, following the demand incident to advancing foundry iron prices, while steel scrap is inclined to weaken owing to the large supply coming in from the country and for other reasons. The market is, on the whole, in a very comfortable position, with No. 1 machinery \$3 to \$4 higher. We quote per gross ton, f.o.b. Birmingham district yards, as follows:

Old steel axles.....	\$35.00 to \$36.00
Old steel rails.....	20.50 to 21.50
No. 1 wrought.....	22.50 to 23.50
No. 1 heavy melting steel.....	19.00 to 20.00
No. 1 machinery cast.....	22.50 to 23.50
Carwheels.....	18.00 to 18.50
Tram carwheels.....	16.00 to 16.50
Stove plate and light.....	14.50 to 15.00
Turnings.....	10.50 to 11.00

St. Louis

ST. LOUIS, MO., May 14, 1917.

Pig Iron.—Demand for pig iron has shown little slackening during the week, but the actual transactions have fallen off because of the inability of buyers and sellers to get together. This has been particularly true in cases where 1918 contracts in double the quantity were a prerequisite to getting tonnage for last-quarter delivery. In consequence, the sales for the week were probably not in excess of 5000 tons, in amounts ranging from 800 tons downward. Prices range from \$40, Birmingham, for No. 2 Southern foundry for last-quarter delivery down to \$36 for first half of 1918, with a very large proportion of the furnace representatives holding for \$40 for practically all deliveries. Some sales of Lake Superior charcoal iron have been made as high as \$50, furnace. Broadly speaking, the sales are now entirely dependent upon the acuteness of the needs and the willingness of furnaces to sell, and prices are made accordingly.

Coke.—Transactions in coke for last-half delivery, with some few for first half of 1918 in addition, are

being made, with prices held firmly at the figures last given for deferred delivery, while nearby and spot sales are at buyer's need. By-product coke, so far as local and nearby territory possibilities are concerned, is practically out of the market for some time to come.

Finished Iron and Steel.—Consumers are not pressing for contracts, chiefly because of their knowledge of the practical impossibility of getting them through. Urgency of demand on existing contracts is also being met with little in the way of satisfaction from the mill representatives who acknowledge themselves helpless in aiding the situation. Movement out of warehouse is up to the capacity of the working forces to handle and the supplies on hand.

For stock out of warehouse, we quote as follows: Soft steel bars, 4.55c.; iron bars, 4.50c.; structural material, 5.05c.; tank plates, 6.05c.; No. 10 blue annealed sheets, 7.05c.; No. 28 black sheets, cold rolled, one pass, 7.60c.; No. 28 galvanized sheets, black sheet gage, 10c.

Old Material.—A better tone is apparent in the scrap market and because of the prices developing at other points it is becoming possible in some instances to ship out of the St. Louis territory, especially to the north and east. In consequence, the dealers are feeling more inclined to buy and are covering shorts freely. Mills have begun to buy and in some cases are taking all they can get. The present demand is chiefly for steel scrap and the general need for material has caused an advance from last reports in many items on the list. Two small roads in the St. Louis territory, one of 15 miles and the other 39 miles, were bought by a dealer during the week, and the rails will soon come on the market, as they grade up to relaying value to a large degree. These are all 65-lb. material. Lists out during the week included these: Missouri, Kansas & Texas, 400 tons; Frisco, 800 tons; Wabash, 4000 tons; Mobile & Ohio, 1500 tons; Union Pacific, 2000 tons. We quote dealers' prices, f.o.b. customers' works, St. Louis industrial district, as follows:

Per Gross Ton	
Old iron rails	\$32.00 to \$32.50
Old steel rails, rerolling	33.00 to 33.50
Old steel rails, less than 3 ft.	30.00 to 30.50
Relaying rails, standard section, subject to inspection	39.00 to 40.00
Old carwheels	24.50 to 25.00
No. 1 railroad heavy melting steel scrap	28.00 to 28.50
Heavy shoveling steel	24.00 to 24.50
Ordinary shoveling steel	22.00 to 23.00
Frogs, switches and guards cut apart	28.00 to 28.50
Ordinary bundled sheet scrap	16.00 to 16.50
Heavy axle and tire turnings	15.50 to 16.00

Per Net Ton	
Iron angle bars	\$31.50 to \$32.00
Steel angle bars	26.00 to 26.50
Iron car axles	41.50 to 42.00
Steel car axles	39.00 to 40.00
Wrought arch bars and transoms	33.50 to 34.00
No. 1 railroad wrought	30.50 to 31.00
No. 2 railroad wrought	29.00 to 29.50
Railroad springs	26.50 to 27.00
Steel couplers and knuckles	28.00 to 28.50
Locomotive tires, 42 in. and over, smooth inside	39.00 to 39.50
No. 1 dealers' forge	24.00 to 24.50
Cast iron borings	12.00 to 12.50
No. 1 busheling	20.50 to 21.00
No. 1 boilers, cut to sheets and rings	17.50 to 18.00
No. 1 railroad cast scrap	21.00 to 21.50
Stove plate and light cast scrap	13.50 to 14.00
Railroad malleable	20.50 to 21.00
Agricultural malleable	17.00 to 17.50
Pipes and flues	18.00 to 18.50
Heavy railroad sheet and tank scrap	17.00 to 17.50
Railroad grate bars	14.50 to 15.00
Machine shop turnings	13.00 to 13.50

San Francisco

SAN FRANCISCO, CAL., May 8, 1917

Practically all concerns manufacturing steel products are operating at capacity, with the exception of the structural fabricators. The latter are suffering from rather dull business on account of the prohibitive building costs. Their work is confined largely to industrial and government building. Both in ship building and commercial structures, the tendencies are toward wooden construction where practicable. Concrete buildings are on the increase, which stimulates the demand for reinforcing materials. The export inquiries for sheets, bars and plates are very numerous, but little can be done under existing circumstances to take advantage of this business. Premium prices on various steel commodities have become so general that

it is suspected that some mills are susceptible to no other class of business for the time being, despite the urgent needs of the regular trade. Municipal and State projects are being curtailed conservatively in view of war-time conditions, except in such lines as further the idea of general preparedness.

Bars.—The heaviest demand is on reinforcing material, but general consumption is fair on other bars. Local manufacturers are able to make prompt deliveries, which places the jobbers and contractors in a position to handle their business on an economic basis. The base price remains at 4.50c. to 4.75c., the latter for small lots. Manufacturers quote reinforcing bars at the same figures. Jobbers are quoting 3-in. and under at 5.25c.; over 3-in. and under $\frac{3}{4}$ -in., 6c.; small rounds and squares, twisted bars and bands, 6c.

Structural Material.—The principal business on high-class fabricated is for small extension jobs and miscellaneous construction work, added to which is new government work planned by reason of the war. A few new bridges are in contemplation, but the most important contracts for the season have already been let. Structural material in carload lots is quoted at 5.50c. Universal plates cost 7c. laid down in San Francisco from the East for delivery in the second quarter, 1913. By paying a premium of about \$10 a ton it is possible to get material in three or four months. The McClintic-Marshall Company has been awarded the contract to supply 300 tons of structural for Government storehouses in Honolulu. The Shrader Iron Works, San Francisco, has fabricated the steel, and is erecting the frame for a new business block at 1127 Market Street.

Plates.—Stocks are badly demoralized by the scarcity of materials and uncertainty of future deliveries from the mills. Jobbers are so ill-equipped to take care of their domestic trade that they are compelled to ignore premium offers from abroad. Tank plates, $\frac{1}{4}$ in., are quoted by jobbers at 8.50c.

Sheets.—The situation has grown steadily worse, so that sheets are getting to be almost as scarce as plates. The San Francisco price on No. 10 blue annealed from the mills is 7.75c. Flat galvanized is quoted by manufacturers at 9.85c. laid down in San Francisco. Jobbers quote No. 10 blue annealed at 8.50c. No. 28 flat galvanized is priced at 10.83c. and Nos. 12 and 14 flat galvanized at 9.95c. Blue annealed amounting to 300 tons is to be supplied for the Paradise irrigation project in Northern California this summer.

Wrought Pipe.—Standard goods have been advanced six points in the past week, or about \$12 a ton, oil country pipe in proportion, by the large independent companies. Deliveries from the mills are from 16 to 18 months. Black $\frac{3}{4}$ -in., in lots less than 18 tons, are quoted by jobbers at 7.65c., and galvanized at 10c. In carload lots the prices are 7.20c. and 9.40c., respectively.

Cast Iron Pipe.—Business on the Coast has fallen off in the past month or so. There is no very important water supply project under way at present, and the time is not propitious for undertaking extensive municipal improvements along this line. Occasional export orders help to bring up the general average of tonnage placed. The price on 4-in. is \$66, and on 6-in., \$63, and larger, class B and heavier, with a dollar extra for class A and gas pipe.

Pig Iron.—An average price of about \$50 a ton is reported on No. 1 foundry for delivery to San Francisco plants, but few are taking any. The largest foundries predict a serious shortage within six months when the bulk of stocks on hand will have been exhausted.

Coke.—Spot stocks hard to get, but supplies at 90 days are offered at \$28.

Old Materials.—High prices and fair weather have brought to market large supplies of old materials of all grades, and buyers report slightly lower rates. Dealers, however, are inclined to demand premiums wherever possible. First-class steel scrap is to be had as low as \$20, though sales of small quantities are frequent at \$21. Cast iron scrap sold last week from \$28 to \$30. The railroads are reported to be asking as high as \$35 for miscellaneous railroad scrap, but no

sales are on record at this figure. Mixed steel scrap is selling around \$19; heavy machinery cast at \$27.50; wrought at about \$21; light cast at \$18 and burnt cast at \$16.50 or lower.

New York

NEW YORK, May 16, 1917.

Pig Iron.—The foundry iron market is very quiet and there is no activity in steel-making grades. In foundry irons sales foot up only a few thousand tons, of which the largest is a lot of 1500 tons of No. 2 foundry, sold to a New Jersey melter for delivery the first half of next year, the iron being divided between eastern and western Pennsylvania furnaces at current quotations. An up-State foundry bought 1000 tons of No. 2 for delivery the last half of this year and the first half of next, and two lots of 500 tons each for delivery the first half of 1918 were sold to New Jersey foundries. In spite of the dullness prices are firm and for No. 2X foundry iron \$43.75, delivered at tide-water, seems to be the minimum quotation. Buffalo prices continue to show considerable irregularity. We quote at tidewater for early delivery as follows:

No. 1 foundry.....	\$44.75 to \$45.25
No. 2 X.....	43.75 to 44.25
No. 2 plain.....	43.25 to 43.75
Southern No. 1 foundry.....	43.00 to 44.00
Southern No. 2 foundry and soft....	41.00 to 42.00

Ferroalloys.—There is somewhat less tension in the ferromanganese situation and spot domestic alloy is now quoted at \$400 to \$425, delivered, with material on contract obtainable for delivery this year at about \$350 to \$375. Inquiries from consumers, large or small, are not insistent, and but little is reported sold in the last week. Important in recent developments are the steps being taken by the Government to ascertain the supply of alloy in the country. The alloy committee of the Council of National Defense, on which the manufacturers of ferromanganese in this country have a representative, and the importers one, are sending telegrams to the various consumers requesting the amount of alloy they have on hand and how much they expect to require for consumption this year. So far as the English supply is concerned it is believed that assurances have been given that a fairly large amount will be available, though it is estimated that it will not be as much as the average for 1916, which was 7500 tons a month. While the receipts in April have probably been the lowest in any month for some time, the prospect for May is better, as the advices to one importer are that he will receive considerably more than he did in April and because another importer is now receiving licenses for shipment after having had none since February. The unusually high price of 90c. to \$1 per unit for manganese ore has resulted in the successful working of small deposits in the West and shipments of this ore are now coming to Eastern furnaces from both California and Arizona. One small mine in Arizona is shipping at least a carload a day. A dealer in foreign manganese ore states that within a few weeks he expects to have afloat several thousand tons of Indian manganese ore coming to this country. The last sale of this ore was made at 95c. per unit, seaboard. Spiegeleisen, 20 per cent, continues strong and active, sales having been made in the past week as high as \$80 furnace. There are inquiries for about 4000 tons before the market and the quotation for delivery this year is \$80 to \$85, furnace, with next year's delivery held at about \$75, furnace, some business for that position having already been done. It is intimated that a lower price than \$250, delivered, will soon prevail for most of the high-grade ferrosilicon which will be needed for the balance of the year. This material has been selling from \$200 to \$250, delivered, depending on conditions. On the 2400 tons of 80 to 85 per cent ferrosilicon asked for by the Government last week \$190.40 has been bid on 1200 tons for delivery in the last half of this year and \$224 per ton on the other 1200 tons for delivery in the first half of 1918, both f.o.b. plant.

Structural Material.—The report of the Bridge Builders and Structural Society, showing that 61 per

cent of the capacity of the bridge and structural shops of the country was put under contract in April came as a surprise to the market, in view of the high prices prevailing. The April figures are as high as the average for both January and February, and contrast with the 68 per cent reported in March. Very little business is reported closed in the past week and new projects brought before the market have been few. Among contracts that have been definitely closed may be mentioned 300 tons for four bridges for the Pennsylvania railroad and 100 tons for a highway bridge for the Boston & Maine, both taken by the American Bridge Company; 550 tons for several bridges for the Central Railroad of New Jersey awarded to the McClintic-Marshall Company; 300 tons for an office and storage building for the Bridgeport Brass Company to the Eastern Bridge & Structural Company, and 330 tons for a bascule bridge at Elizabeth, N. J., to the Great Lakes Bridge & Dry Dock Company. It is understood that the 2000 tons required for hangars for the aviation field at Pensacola, Fla., will go to the Virginia Bridge & Iron Works. The 500 tons proposed for the Eberhart Pencil Company, Brooklyn, N. Y., has been abandoned, and it is believed that this is also true of several other projects for buildings recently up for bids. Among the new undertakings before the market in the past week may be mentioned 275 tons for a cab shop for the Pennsylvania railroad at Altoona, and 125 tons for one bridge for the same railroad; 100 tons for two bridges for the Boston & Maine and 800 to 900 tons for water tanks for the Government arsenal at Watertown. We quote plain material from mill at 4.419c. to 4.919c., New York, the lower price in three to four months and the higher for small lots in earlier deliveries. It is difficult to secure the lower price. For example, some 400 tons of light sections for October delivery were sold on a basis of 4.75c., Pittsburgh. For future shipments, 4.169c. seems to be the minimum. Shipments from warehouses are 5c. per lb., New York.

Steel Plates.—A new high price has been established for hull plates in the sale of 1000 tons to Canada at 10.40c., Pittsburgh. The 10,000 tons of tank plates reported sold last week at 7.50c., Pittsburgh, go to two different companies, 5000 tons each, and cover the third quarter. It is doubtful that tank plates can be obtained for quick shipment in a large lot for less than 7.25c., 1500 tons having been sold under such conditions at this price, but it is difficult to establish a market and some credence must be given to the statements of some sellers that 6.75c. is minimum, and accordingly we quote this price with little knowledge where such material may be obtained with any degree of promptness. The wide range of prices is indicated in an offer to a mill of a few hundred tons of marine steel at no less than 20c. per lb., and for delivery several months hence. The mill has as yet not accepted the offer. We quote mill shipments of universal and tank plates at 6.919c. to 7.669c., New York, with little available before the last quarter, and ship plates at 8.169c. and higher, New York, the price depending on the outcome of each individual bargaining. We now quote plates out of store at 7.50c., New York.

Other Finished Steel.—Higher prices have been made on tin plate for export. An equivalent of 50,000 base boxes have been sold at \$13.50 for the last quarter. An offer of \$25.75, New York, has been made for 100,000 double boxes for first half of 1918 without acceptance as yet. One exporter has had a quotation from a mill of \$15 per base box. Prices are generally wild; for example, one office has received prices on wire rods of \$80, \$90, \$91 and \$95 per gross ton. Business has been done at \$85 and \$87.50 on about 600 tons, and a late quotation on 1000 tons is \$90. On small billets 5c. per lb. has been asked. On about two carloads of ash-can bands, on which about \$5 per ton above bar prices is usually asked, a mill has quoted an advance over steel bars of \$25 per ton for delivery in several months, but the buyer, without success it is believed, offered \$40 per ton above the bar price if he could have delivery in three or four weeks. An inquiry for 25,000 tons of 67½-lb. rails for the Department of the Caucasus.

apparently not a direct government inquiry from Russia, is noted. The 20,000 tons for France are about 60-lb rails. France wants 3900 tons of angles 2 in. in size and upward into the structural mill sizes, but the report is that the buyer does not feel it necessary to pay more than 3.50c. per lb. An unusual order now being executed covers 500,000 scythes for Russia, regarded as the first part of perhaps a total of 6,000,000 scythes. There is some evidence that contractors for Government buildings are striving to secure reinforcing bars at less than the going market, some of this, indeed, merely for the purpose of making bids. Included in this is a large tonnage for the Rock Island Arsenal. We quote steel bars at 4.169c. to 4.669c., New York, with almost an absence of any sizeable purchases, and iron bars at 4.169c., New York. From New York district warehouses we quote iron bars at 4.60c. and steel bars at 4.75c.

Cast-Iron Pipe.—The high price of pig iron evidently has deterred municipalities from placing orders and the only inquiry of any importance that has appeared is one for 500 tons from the Commissioners of the District of Columbia on which bids will be taken June 7. Private buying is fairly active. Carload lots of 6-in., class B and heavier, are now quoted at \$55.50 per net ton, tidewater, with class A and gas pipe taking an extra of \$1 per ton.

Old Material.—The troubles of the old material dealers are multiplying, due in part to the increasingly serious problems connected with labor and in part to the attitude of the Government as to cars. Owing to the enlistment of many men for military service, scarcity of labor has increased and as high as 37½c. per hour is being paid. Some men who last year were earning \$2 per day are now being paid \$3.75. It is reported that the Government will give shippers of ore and coal preference over shippers of scrap and will divert gondola cars from the scrap business. Scrap dealers say that if this policy is carried out it will cause very serious embarrassment to the steel mills, as the scrap can easily be unloaded from gondola cars by lifting magnets, but in the case of other cars hand labor is necessary and it is next to impossible to add to the number of laborers employed. There is marked activity in railroad wrought and machinery cast and prices, especially of machinery cast, have advanced sharply. Brokers quote buying prices as follows to local dealers and producers, per gross ton, New York:

Heavy melting steel scrap (for shipment to eastern Pennsylvania).....	\$22.50 to \$23.00
Old steel rails (short lengths) or equivalent heavy steel scrap.....	24.50 to 25.00
Relaying rails	43.00 to 44.00
Rerolling rails	35.00 to 35.50
Iron and steel car axles.....	46.00 to 47.50
No. 1 railroad wrought.....	40.00 to 41.00
Wrought-iron track scrap.....	34.00 to 35.00
No. 1 yard wrought, long	33.00 to 33.50
Light iron	7.50 to 8.00
Cast borings (clean)	13.50 to 14.00
Machine-shop turnings	12.50 to 13.00
Mixed borings and turnings.....	12.00 to 12.50
Wrought-iron pipe (not galvanized or enameled)	20.00 to 20.50

Owing to the slow delivery of pig iron machinery cast is in very active demand and prices have been marked up fully \$2 per ton. Dealers in New York City and Brooklyn are quoting as follows to local foundries, per gross ton:

No. 1 machinery cast.....	\$29.00 to \$30.00
No. 1 heavy cast (column, building material, etc.)	26.00 to 26.50
No. 2 cast (radiators, cast boilers, etc.)	22.00 to 23.00
Stove plate	17.50 to 18.00
Locomotive grate bars.....	17.00 to 17.50
Old carwheels	27.00 to 28.00
Malleable cast (railroad).....	24.00 to 24.50

The National Industrial Conference Board, of which Magnus W. Alexander is executive secretary, issues from its office, 15 Beacon Street, Boston, a weekly survey of industrial news relating to workmen's compensation, wages, hours of labor, cost of living, industrial legislation, labor supply, Government action on trade questions and other subjects of interest to employers. For the most part the summary consists of paragraphs condensing news matter from the daily papers.

Buffalo

BUFFALO, N. Y., May 15, 1917.

Pig Iron.—A fairly good aggregate tonnage of various grades has been disposed of during the past week, one interest having sold nearly 20,000 tons of all grades, covering both 1917 and 1918 deliveries, quite a little of it being for first half of 1918. The purchases consisted principally of small lots, from carloads to 200 or 300 tons; but including one lot of 1000 and one of 4000 tons, foundry grades, for next year's delivery. The price range now runs at about \$46 to \$47 for this year's delivery, with the exception that one producing interest, which is selling for prompt delivery only, is taking business at less than these figures, and has closed some sales at from \$43 to \$45. This is not affecting the general price level of the other furnaces, however, as they are unable to furnish all the iron that the inquiry before the market would call for at the higher schedule of prices, as quoted below. A considerable tonnage of charcoal iron has also been sold during the week for next year's delivery, comprised of only moderate lots in each sale. Charcoal iron for prompt shipment is almost unobtainable, the price for the small amount obtainable for current delivery being \$50 to \$51.50, f.o.b. Buffalo. We quote as follows for 1917 delivery, f.o.b. furnace, Buffalo:

High silicon irons	\$47.00
No. 1 foundry	46.00
No. 2 X foundry	45.50
No. 2 plain	45.00
No. 3 foundry	45.00
Gray forge	45.00
Malleable	\$46.00 to 47.00
Basic	46.00 to 47.00
Charcoal (nominal)	50.00 to 51.50

Finished Iron and Steel.—Inquiries from Canada have been large, especially for semi-finished products, and for bars and ship plates. Domestic inquiry has been comparatively quiet, and sales of small volume, and in many instances inquiries submitted to mills have been declined because of the uncertainty as to the requirements of the Government.

Old Material.—Dealings for the week have been restricted and to a certain extent tendencies toward price advances have been checked. Railroad malleable and locomotive grate bars have, however, advanced quite materially, particularly the former, which has gone up over one dollar per ton in price. Dealers' asking prices per gross ton, f.o.b. Buffalo, are as follows:

Heavy melting steel	\$27.50 to \$28.00
Low phosphorus	36.00 to 38.00
No. 1 railroad wrought	37.00 to 38.00
No. 1 railroad and machinery cast.....	28.00 to 28.50
Iron axles	45.00
Steel axles	45.00
Carwheels	26.50 to 27.50
Railroad malleable	27.50 to 28.50
Machine shop turnings	13.00 to 13.50
Heavy axle turnings	19.50 to 20.00
Clean cast borings	13.00 to 13.50
Iron rails	29.50 to 30.00
Locomotive grate bars.....	18.00 to 18.50
Stove plate	18.00 to 18.50
Wrought pipe	17.00 to 17.50
No. 1 busheling scrap	23.00 to 23.50
No. 2 busheling scrap	14.00 to 14.50
Bundled sheet scrap	16.50 to 17.00

Manganese-Ore Movements

Manganese ore exports from India for the nine months ended Dec. 31, 1916, are reported as 466,101 gross tons as compared with 358,336 tons in the same period in 1915. Of the former total the United Kingdom took 348,192 tons as against 295,640 tons of the 1915 total.

British manganese ore imports in February were 29,767 gross tons. This compares with 32,047 tons in January and with 36,625 tons per month in 1916. The total for the first two months of 1917 is 61,814 tons as compared with 56,622 tons for the same two months in 1916.

The Parsons Mfg. Company, Detroit, maker of automobile body hardware, has outgrown its plant and leased a new factory at Stanley and Vermont avenues, where the floor space will provide three times the present capacity. New equipment will be installed and it is planned to have this in operation by June 1.

British Steel Market

Tin Plates Advancing and Wire Rods High— Ferromanganese Quoted Higher

(By Cable)

LONDON, ENGLAND, May 16, 1917.

The pig-iron market is firm, but quieter, and tin plates are strong at 30s. 6d. and upward. Oil tin plates have recently sold at 30s., but are now nominal. Ferromanganese is strong and nominal at about £44. Semi-finished steel is dull with offers lacking, but wire rods for June shipment have sold for £27 15s., c.i.f., Liverpool. We quote as follows:

Tin plates, coke, 14 x 20, 112 sheets, 108 lb., f.o.b. Wales, 30s. 6d. against 29s. 6d. last week.

Ferromanganese, £44 nominal.

Ferrosilicon, 50 per cent, c.i.f., £35 upward.

Ferromanganese Tighter—Price and Cost of Tin Plates Advancing

(By Mail)

LONDON, ENGLAND, April 24, 1917.—The pressure of war needs continues the dominant feature and seems unlikely to be modified for months to come. No abatement is indicated in the drastic restrictions on the use of steel for other than war work, while allotments of steel bars to the tin-plate mills have been reduced by another 15 per cent since Easter.

Pig iron is firmer, as already cabled. The home trade price of Cleveland iron has been raised to a 92s. 6d. basis for No. 3, thus placing this material on a more reasonable basis compared with Midland brands, the price of which was relatively high. F.o.b. prices for Cleveland No. 3 for export have also been raised by 5s. to 102s. 6d. Iron-makers still cling to the hope of some adjustment of maximum prices in other directions and the terms quoted are subject to a possible revision. Shipments from the Cleveland district continue in arrears, and material earmarked for export is accumulating in makers' yards so that licenses are being carried over from month to month, while clearances are confined to France and Italy. A few big shipments, however, have been made just lately. Transit difficulties have been somewhat remedied, and deliveries to home consumers are more regular. Hematite is tighter and makers urge an adjustment of the maximum rate.

The stiffness in finished iron and steel has lately become accentuated, uncontrolled prices having been advanced in some cases and makers generally reserving the right to revise their prices for orders in hand in the event of a rise in pig iron. Lancashire and Staffordshire iron and steel hoop-makers have put up their terms £1 a ton and gas strip is 15s. dearer. Unprecedented activity prevails at all the steel plants, which are running at their fullest capacity, and in view of the intense pressure of war work merchant business has almost ceased. The heavy requirements of shipbuilders, however, are being met liberally.

Easier conditions in semi-finished steel are not likely. After special needs, the surplus output is relatively small, and its distribution remains under close official supervision. American billets have remained practically a dead letter, c.i.f. quotations being unobtainable.

Ferromanganese Harder to Obtain

It is becoming more and more difficult to get orders through in ferromanganese, British producers being heavily sold ahead. Near shipment is unobtainable, and prices are now round about £40 f.o.b. for loose forward shipment, but where urgent demands arise the few sellers in evidence seem able to dictate their own terms. Recent business for the United States and Canada on c.i.f. terms was done, it is claimed, at prices ranging up to about \$250 for forward shipment, and the demand continues.

Prices of tin plates are advancing, with the cost likely to go higher. The position is growing more stringent, because of the greatly curtailed supply of steel bars and there is a steadily increasing demand.

Quotations are now on the basis of 28s. 3d. to 28s. 9d., 20 x 14, f.o.b., and makers whose order books are well filled chiefly for war work, are much more reserved. Export business is very restricted, comparatively few permits now being issued, although Allied countries' needs are being met as far as possible. Home trading remains under restrictions, although additional facilities have been granted lately to dispose of stock lots not considered suitable for war work.

Contracts for Sheet Mill Plant

PITTSBURGH, May 16—(By Wire).—The Liberty Steel Company, recently organized to build a new sheet mill plant at Warren, Ohio, has placed a contract with the Hunter Construction Company of Youngstown, Ohio, for its buildings. These are to consist of two aisle steel mill buildings from 500 to 600 ft. long, each aisle being 75 ft. wide with two 30-ft. leantos, also a warehouse 75 ft. x 250 ft., together with smaller miscellaneous buildings required with the mill. The company has placed contracts with the Westinghouse Electric & Mfg. Company for all the motors, as all equipment will be electrically driven. The Hyde Park Foundry & Mach. Company will furnish the mills and other equipment, and Pawling & Harnischfeger will furnish all the cranes. The output will average about 3000 tons per month of high grade sheets for automobile bodies, hoods and fenders and also for metal furniture. The officers of the company are E. F. Clark, president and treasurer; H. M. Steele, vice-president and general manager; R. A. Kenworthy, secretary and general manager of sales.

Great Activity in the Youngstown District

YOUNGSTOWN, OHIO, May 15.—Steel mills are operating to maximum capacity, with predictions made that the drafting of young men for the army and the volunteer enlistments will make the present labor shortage more acute. The Wm. B. Pollock Company, erector of steel and metal work, has been advertising extensively in the past week for unskilled and skilled labor. This company has several important contracts on hand, two different orders being to supply blast-furnace parts for plants in India. The fuel situation is still causing concern and steel companies are actively developing or operating their coal properties.

The Youngstown Iron & Steel Company, now a subsidiary of the Sharon Steel Hoop Company, is planning to start a plate mill that has been idle for over two years. The increased demand for plates in shipbuilding has caused the company to put the mill in commission, believing that its increased open-hearth capacity will provide the additional steel required. The crews have all been engaged and activities will commence within a few days.

The increased prices for boiling as well as the advance given sheet and tin-plate workers by the present steel market, will make it difficult for the conferees at the annual wage conference to be held likely at Atlantic City in June. The Amalgamated Association delegates will strive to their utmost to hold up prices in all of the divisions governed by the annual agreement. The price paid puddlers, \$11.80 per ton, was never dreamed of before. Neither did the independent manufacturers ever believe that sheet mill men would be working 53c. above the base rates and tin-plate workers 49 per cent as has just developed. One year ago, puddlers were earning \$8.80 a ton with bar iron selling on a 1.85c. card.

The Trumbull Steel Company, Warren, Ohio, expects to be employing 5000 men in November. During the last week, cold strip mills were placed in operation, being electrically driven. It is expected to get the hot strip mills in commission in October. The building that will house the hot strip mills is about completed and will be 1000 ft. long.

According to the figures presented by President Jonathan Warner, the Trumbull Steel Company did approximately \$15,000,000 worth of business last year. Not one dollar of this amount consisted of war orders.

staples, \$4.35; painted, \$3.65. Wire nails, \$3.50. Galvanized nails, 1 in. and longer, \$2.20 advance over base price; shorter than 1 in., \$2.70 advance over base price. Cement coated nails, \$3.40. Woven wire fencing, 48 per cent off list for carloads, 47 off for 1000-rod lots, 46 off for less than 1000-rod lots.

Freight rates from Pittsburgh in carloads, per 100 lb.: New York, 16.9c.; Philadelphia, 15.9c.; Boston, 18.9c.; Buffalo, 11.6c.; Cleveland, 10.5c.; Cincinnati, 15.8c.; Indianapolis, 17.9c.; Chicago, 18.9c.; St. Louis, 23.6c.; Kansas City, 43.6c.; Omaha, 43.6c.; St. Paul, 32.9c.; Denver, 68.6c.; New Orleans, 30.7c.; Birmingham, Ala., 45c. Denver, pipe, 76.1c., minimum carload, 46,000 lb.; structural steel and steel bars, 83.6c., minimum carload, 36,000 lb. Pacific coast (by rail only), pipe, 65c.; structural steel and steel bars, 75c., minimum carload, 50,000 lb.; structural steel and steel bars, 80c., minimum carload, 40,000 lb. No freight rates are being published via the Panama Canal, as the boats are being used in transatlantic trade.

Structural Material.—I-beams, 3 to 15 in.; channels, 3 to 15 in.; angles, 3 to 6 in. on one or both legs, $\frac{1}{4}$ in. thick and over, and zees 3 in. and over, 4c. Extras on other shapes and sizes are as follows:

	Cents per lb.
I-beams over 15 in.....	.10
H-beams over 18 in.....	.10
Angles over 6 in., on one or both legs.....	.10
Angles, 3 in. on one or both legs less than $\frac{1}{4}$ in. thick, as per steel bar card, Sept. 1, 1909.....	.70
Tees, structural sizes (except elevator, handrail, car truck and conductor rail).....	.05
Channels and tees, under 3 in. wide, as per steel bar card, Sept. 1, 1909.....	.20 to .80
Deck beams and bulb angles.....	.30
Handrail tees.....	.75
Cutting to lengths, under 3 ft. to 2 ft. inclusive.....	.25
Cutting to lengths, under 2 ft. to 1 ft. inclusive.....	.50
Cutting to lengths, under 1 ft.....	1.55
No charge for cutting to lengths 3 ft. and over.	

Plates.—Tank plates, $\frac{1}{4}$ in. thick, 6 in. up to 100 in. wide, 6c. to 7c., base, net cash, 30 days, or $\frac{1}{2}$ of 1 per cent discount in 10 days, carload lots. Extras are:

Quality Extras		Cents per lb
Tank steel	Base	10
Pressing steel (not flange steel for boilers).....	Base	10
Boiler and flange steel plates.....	Base	15
"A. B. M. A." and ordinary firebox steel plates.....	Base	20
Still bottom steel.....	Base	30
Locomotive firebox steel	Base	50
Marine steel, special extras and prices on application.		

Gage Extras

Rectangular, $\frac{1}{4}$ in. thick, over 6 in. wide to 100 in. wide. Base	10
Lighter than $\frac{1}{4}$ in., to $\frac{3}{16}$ in., up to 72 in. wide.	20
Lighter than $\frac{1}{4}$ in., including $\frac{3}{16}$ in., over 72 in. to 84	20
Lighter than $\frac{1}{4}$ in., including $\frac{3}{16}$ in., over 84 in. to 96	30
Lighter than $\frac{1}{4}$ in., including $\frac{3}{16}$ in., over 96 in. to 100	40
Lighter than $\frac{1}{4}$ in., including $\frac{3}{16}$ in., over 100 in. to 102	45
Lighter than $\frac{3}{16}$ in., including No. 8, up to 72 in. wide	15
Lighter than $\frac{3}{16}$ in., including No. 8, over 72 in. to 84	25
Lighter than $\frac{3}{16}$ in., including No. 8, over 84 in. to 96	35
Lighter than No. 8, including No. 10, up to 60 in. wide	30
Lighter than No. 8, including No. 10, over 60 in. to 64	35
Up to 72 in. and not less than 10.2 lb. per sq. ft. will be considered $\frac{1}{4}$ in.	
Over 72 in. must be ordered $\frac{1}{4}$ in. thick on edge, or not less than 11 lb. per sq. ft. to take base price.	
Over 72 in. wide, ordered less than 11 lb. per sq. ft., down to weight of $\frac{3}{16}$ in., take price of $\frac{3}{16}$ in.	
Over 72 in., ordered weight $\frac{3}{16}$ in., take No. 8 price.	
Over 72 in., ordered weight No. 8, take No. 10 price.	

Width Extras		
Over 100 in.	to 110 in. inclusive	.08
Over 110 in.	to 115 in. inclusive	.10
Over 115 in.	to 120 in. inclusive	.15
Over 120 in.	to 125 in. inclusive	.25
Over 125 in.	to 130 in. inclusive	.50
Over 130 in.		1.00

Length Extras	
Universal plates 80 ft. long up to 90 ft. long.....	.03
Universal plates 90 ft. long up to 100 ft. long.....	.10
Universal plates 100 ft. long up to 110 ft. long.....	.20

<i>Cutting Extras</i>	
No charge for rectangular plates to lengths 3 ft. and over.	
Lengths under 3 ft. to 2 ft. inclusive.....	.25
Lengths under 2 ft. to 1 ft. inclusive.....	.50
Lengths under 1 ft.....	1.50
Circles 3 ft. in diameter to 100 in.....	.30
Circles over 100 to 110 in. (width extra).....	.33
Circles over 110 to 115 in. (width extra).....	.40
Circles over 115 to 120 in. (width extra).....	.45
Circles over 120 to 125 in. (width extra).....	.50
Circles over 125 to 130 in. (width extra).....	.80
Circles over 130 in. (width extra).....	1.30
Circles under 3 ft., to 2 ft., inclusive.....	.20
Circles under 2 ft., to 1 ft., inclusive.....	.80
Circles under 1 ft.....	1.80
Half circles take circle extras.....	
Sketches not over four straight cuts, inc. straight taper.....	10
Sketches having more than four straight cuts.....	20
Plates sheared to a radius take complete circle extras.....	

*Including extra for width.

Wire Rods.—Including chain rods, \$85 to \$90.

Wire Products.—Prices to jobbers, effective April 20: Fence wire Nos. 6 to 9, per 100 lb., terms 60 days or 2 per cent discount in 10 days, carload lots, annealed, \$3.45; galvanized, \$4.15. Galvanized barb wire and

Wrought Pipe.—The following are the jobbers' car-load discounts on the Pittsburgh basing card in effect from May 1, 1917, all full weight:

Steel		Butt Weld		Iron	
Inches	Black	Galv.	Inches	Black	Galv.
1/8, 1/4 and 3/8	42	15 1/2	1/8 and 1/4	30	3
1/2	46	31 1/2	3/8	31	4
3/4 to 3	49	35 1/2	1/2	35	17
			3/4 to 1 1/2	38	22
Lap Weld					
2	42	29 1/2	1 1/4	23	8
2 1/2 to 6	45	32 1/2	1 1/2	30	16
7 to 12	42	28 1/2	2	31	17
13 and 14	32 1/2		2 1/2 to 4	33	20
15	30		4 1/2 to 6	33	20
			7 to 12	32	14

Butt Weld, extra strong, plain ends					
$\frac{1}{8}$, $\frac{1}{4}$ and $\frac{3}{8}$	38	$20\frac{1}{2}$	$\frac{1}{8}$, $\frac{1}{4}$ and $\frac{3}{8}$	29	12
.....	43	$30\frac{1}{2}$	$\frac{1}{2}$	34	21
$\frac{3}{4}$ to $1\frac{1}{2}$	47	$34\frac{1}{2}$	$\frac{3}{4}$ to $1\frac{1}{2}$	38	23
2 to 3.....	48	$35\frac{1}{2}$			

<i>Lap Weld, extra strong, plain ends</i>		
3	40	1 1/4
3 1/2 to 4	43	1 1/2
4 1/2 to 6	42	2
7 to 8	38	2 1/2 to 4
9 to 12	33	4 1/2 to 6
		7 to 8
		9 to 12

To the large jobbing trade an additional 5 per cent is allowed over the above discounts, which are subject to the usual variation in weight of 5 per cent. Prices for less than carloads are two (2) points lower basing (higher price) than the above discounts on black and three (3) points on galvanized, but in some sections of the country discounts on less than carloads are three (3) points less (higher price) than the carload discount on both black and galvanized steel pipe.

On butt and lap weld sizes of black iron pipe, discounts for less than carload lots to jobbers are four (4) points lower (higher price) than carload lots, and on butt and lap weld galvanized iron pipe are five (5) points lower (higher price).

Boiler Tubes.—Nominal discounts on less than carloads, freight added to point of delivery, effective from Nov. 1, 1916, on standard charcoal iron tubes, and from April 2, 1917, on lap welded steel tubes are as follows:

Lap Welded Steel		Standard Charcoal Iron	
1½ and 2 in.	31	1½ in.	23
2½ in.	28	1½ and 2 in.	30
2½ and 3½ in.	34	2½ in.	33
3 and 3½ in.	34	2½ and 3½ in.	33
3½ to 4½ in.	34	3 and 3½ in.	43
5 and 6 in.	33	3½ to 4½ in. No quotation	
7 to 13 in.	30	5 and 6 in.	37
		7 to 13 in.	37

Above discounts apply to standard gages and to even gages not more than four gages heavier than standard in standard lengths.

Locomotive and steamship special charcoal grades bring higher prices.

1 3/4 in., over 18 ft., and not exceeding 22 ft., 10 per cent net extra.

2 in. and larger, over 22 ft., 10 per cent net extra.

Sheets.—Makers' prices for mill shipments on sheets of United States standard gage, in carload and larger lots, are as follows, 30 days net, or 2 per cent discount in 10 days.

[Open-hearth stock, \$5 per ton above these prices.]

Blue Annealed—Bessemer		Cents per lb.
Nos. 3 to 8	.....	6.00 to 6.50
Nos. 9 and 10	.....	6.25 to 6.75
Nos. 11 and 12	.....	6.50 to 7.00
Nos. 13 and 14	.....	6.75 to 7.25
Nos. 15 and 16	.....	7.00 to 7.50

Box Annealed, One Pass Cold Rolled—Bessemer		
Nos. 17 to 21	6.80 to 7.30	
Nos. 22 and 23	6.65 to 7.35	
Nos. 24 and 26	6.90 to 7.60	
Nos. 27	6.95 to 7.45	
No. 28	7.00 to 7.50	
No. 29	7.65 to 7.85	
No. 30	7.15 to 7.65	

Galvanized Black Sheet Gage—Bessemer	
Nos. 10 and 11.	7.00 to 7.50
Nos. 12 and 14.	7.10 to 7.60
Nos. 15 and 16.	7.35 to 7.85
Nos. 17 to 21.	7.40 to 7.90
Nos. 22 and 24.	7.55 to 8.05
Nos. 25 and 26.	7.70 to 8.20
No. 27.	7.75 to 8.25
No. 28.	8.00 to 8.50
No. 29.	8.15 to 8.65
No. 30.	8.30 to 8.80

T-Mill Black Plate—Bessemer		
Nos. 15 and 16		6.30 to 6.50
Nos. 17 to 21		6.35 to 8.60
Nos. 22 to 24		6.40 to 6.60
Nos. 25 to 27		6.45 to 6.70
No. 28		6.50 to 6.70
No. 29		6.55 to 6.80
No. 30		6.55 to 6.80
Nos. 30½ and 31		6.60 to 6.70

Metal Markets

The Week's Prices

Cents Per Pound for Early Delivery							
Copper, New York		Tin, New York	Lead, New York		Spelter, New York		St. Louis
May	Lake	Electro- lytic	New York	St. Louis	New York	St. Louis	
9.....	31.00	31.00	63.00	10.45	10.30	9.37½	9.12½
10.....	31.00	31.00	64.00	10.45	10.30	9.37½	9.12½
11.....	31.25	31.25	64.00	10.45	10.30	9.37½	9.12½
12.....	31.25	31.25	.....	10.45	10.30	9.37½	9.12½
14.....	31.50	31.50	65.00	10.45	10.30	9.37½	9.12½
15.....	31.50	31.50	65.75	10.50	10.37½	9.37½	9.12½

NEW YORK, May 16, 1917.

Firmness characterizes all the metals but some are much stronger than others. Copper continues firm but rather inactive. Tin has advanced sensationally and is the strongest of the group. Lead ranks second in strength on sales of considerable volume. Spelter continues firm in a dull market. Antimony, after a recession, has advanced slightly.

New York

Copper.—Conflicting reports are heard as to whether the Government has very recently made purchases of the metal, some declaring that these have been large while others insist that none have been made. It is not improbable that some quiet negotiations have been going on and it is generally assumed that the price involved has been around 25c. to 27c. The conviction is becoming more established that the needs of the Government as well as of the Allies will be met at these prices and that the quantity involved will be very large. While the market has been dull and inactive in the past week these considerations have exercised a strengthening tendency so that the metal is very firm. The quotation for third quarter is variously reported at 28.50c. to 29.50c., at which without doubt some sales have been made, while fourth quarter delivery is around 27c. to 28c. The market for early delivery is entirely nominal and quotations are rather indefinite, not much metal being available this side of July. The nominal quotation yesterday for both Lake and electrolytic was about 31.50c., New York. There has been no change in the London quotation of £142 for spot electrolytic in the last week.

Tin.—Two important factors have been potent in causing the tin market to rise sensationally the past week until the quotation yesterday was 65.75c. for spot Straits, New York. The first of these influences was the recurrence of the announcement that the Government would impose an import duty of 10 per cent on all free commodities, including tin. While this is still to be fought out, late advices indicate that a revision of this proposition is probable, though in the trade some tax is regarded as possible. The other important influence is the large advance in the London market, spot Straits having been quoted yesterday at £253, an advance of nearly £21 since last week. The cause of this is mere conjecture on this side, some attributing it to sunken cargoes or to the withdrawal of ships from the Atlantic service. Sales in the week have not been large, especially in the latter part of last week, but on Monday inquiry for 150 tons of spot and nearby metal appeared, part of which was sold. Yesterday there was less inquiry but heavy sales were reported, probably 150 to 200 tons, mostly for nearby delivery. Arrivals up to and including May 15 were 2680 tons, with the quantity afloat 35.97c.

Lead.—Business has been widespread in a fairly active market and good sales have been reported. The announcement last week by the leading mining paper that the Government's requirements for May and June would be only 2500 tons caused some producers to sell, resulting in the more active market. Late in the week May metal sold at 10.25c., St. Louis, with June metal offered at 10.12½c., St. Louis. Sales are reported to have been made in the East at 10.45c. and 10.50c., New York, the latter being the quotation yesterday. The strength of the market is due to the expectation that

there will not be metal enough to go around when the Government's needs are supplied, some large producers withdrawing largely from the market. One dealer reports that a carload of lead for May-June delivery sold recently at 11.62½c., New York. The quotation of the American Smelting & Refining Company is unchanged at 9.50c., New York, on contract.

Spelter.—The market continues practically unchanged at 9.37½c. to 9.50c., New York, or 9.12½c. to 9.25c., St. Louis, for prompt and May prime Western metal. Sales of fair-sized lots are reported at these prices, but the volume is not large. Trading is quiet and spasmodic and the activity that was expected to follow the Government purchase announced last week has not materialized. It is now stated that the quantity of prime Western spelter really bought by the Government was only 225 tons, the remainder being made up of 6703½ tons of grade A and 3440½ tons of grade B. So small a sale of ordinary spelter could have but little effect on the market as a whole. Producers refrain from quoting beyond June delivery.

Antimony.—After dropping the past week to as low as 22c. for nearby delivery, the market has again stiffened, due to supplies getting into strong hands and sales are now reported at 26c. to 26.50c., New York, for Chinese and Japanese grades. Futures are very strong.

Aluminum.—Spot metal, No. 1 virgin, 98 to 99 per cent pure, is unchanged at 59c. to 61c., New York, for early delivery. Demand is reported as quiet.

Old Metals.—The market is higher. Dealers' selling prices are as follows:

	Cents per lb.
Copper, heavy and crucible.....	29.00 to 30.00
Copper, heavy and wire.....	28.00 to 29.00
Copper, light and bottoms.....	26.50 to 27.00
Brass, heavy.....	19.00 to 20.00
Brass, light.....	15.00 to 16.00
Heavy machine composition.....	25.00 to 26.50
No. 1 yellow rod brass turnings.....	19.00
No. 1 red brass or composition turnings.....	20.00 to 22.00
Lead, heavy.....	9.50
Lead, tea.....	9.00
Zinc.....	7.50

Chicago

MAY 10.—Copper is fairly active, in consequence of which prices show a tendency to advance. Lead continues to show strength, the demand seemingly being greater than the available supply. Spelter is unimproved. Tin is considerably higher, consumers being anxious to buy because of the proposed tariff on its importation. Antimony at last shows a stronger face for the reason that it is more difficult to procure. We quote as follows: Casting copper, 31c.; Lake, 32.50c. to 32.75c.; electrolytic, 33c.; tin, carloads, 66c., and small lots, 69c.; lead, 10.50c.; spelter, 9.25c.; sheet zinc, 19c.; oriental antimony, 28c. to 30c. On old metals we quote buying prices for less than carload lots as follows: Copper wire, crucible shapes, 26c.; copper clips, 26c.; copper bottoms, 23c.; red brass, 23c.; yellow brass, 18c.; lead pipe, 8.50c.; zinc, 6.50c.; pewter, No. 1, 35c.; tin foil, 40c.; block tin, 45c.

St. Louis

MAY 14.—Metals have been rather quiet during the week and closed to-day: Carload lots, lead, 10.50c.; spelter, 9.25c. to 9.50c. Less than carload lots: Lead, 10.75c.; spelter, 10.50c.; tin, 65c.; copper, 34.50c. for Lake and 34c. for electrolytic; Asiatic antimony, 30c. In the Joplin district, ore prices were strong and zinc blende sold at \$80, top price basis of 60 per cent metal ranging down to \$70, with the average held up to \$77 for the district by the strength of the second grade ores. Calamine ranged from \$35 to \$40 per ton, basis of 40 per cent ore, with the average for the district at \$39 because of the strength of the second grades. Lead ore was very strong at \$120, basis of 80 per cent metal, with the district average at the same figure. Operators are stiffening in their prices and further advances are expected during the week. On miscellaneous scrap metals we quote dealers' buying prices as follows: Light brass, 12c.; heavy yellow brass, 13c.; heavy red brass and light copper, 19c.; heavy copper and copper wire, 22.50c.; pewter, 25c.; tin foil, 36c.; zinc, 6.50c.; lead, 6c.; tea lead, 3.50c.

IRON AND INDUSTRIAL STOCKS

War Revenue Bill Has Depressing Effect on Market, Which Rallies Later

NEW YORK, May 16, 1917.

The crude and highly unsatisfactory war revenue bill, which if enacted in anything like its original shape would result in incalculable damage to the business interests of the country, had a depressing effect on the market last week and numerous declines were recorded. There was, however, no violent break, for the great underlying strength of the country was recognized and it was not believed possible that the bill could be passed without being amended in many important particulars. An important event of the week was the resumption of gold shipments by Canada. Last Wednesday \$16,000,000 was received in New York and the week's total was \$48,000,000, while the total for the year to date is about \$382,000,000. Most of the Canadian gold was turned over to the Federal Reserve Bank. The monthly statement of unfilled tonnage of the United States Steel Corporation, showing an increase of 471,439 tons and making the unfilled tonnage exceed 12,000,000 tons, came as a distinct surprise to Wall Street.

In the beginning of the present week, the revenue bill, which has been described by the New York Times as the "patchwork blanket which has been superimposed on the existing scheme of taxation," seemed certain to be amended, as the hearings in the Senate are making a strong impression and the feeling in the stock market was improved. Losses and gains were, however, about equally divided. The range of prices on active iron and industrial stocks from Wednesday of last week to Tuesday of this week was as follows:

Allis-Chal., com.. 22 1/2 - 24 1/2	Int. Har. of N. J., com. 107 1/2 - 110
Allis-Chal., pref.. 80 1/2 - 83	Int. Har. Corp., com. 75 - 76 1/2
Am. Can., com... 39 1/2 - 43	Int. Har. Corp., pref. 103 - 103 1/2
Am. Can., pref... 103 - 105 1/2	Lacka. Steel.... 80 1/2 - 86 1/2
Am. Car & Fdry., com. 61 1/2 - 66 1/2	Lake Sup. Corp.. 17 1/2 - 18 1/2
Am. Car & Fdry., pref. 115 1/2 - 116 1/2	Lima Loco. 53
Am. Loco., com.. 63 - 67 1/2	Lukens, 1st pref. 101 1/2
Am. Loco., pref. 102 1/2	Midvale Steel... 54 1/2 - 57 1/2
Am. Rad., pref. 133	Nat.-Acme 32 1/2 - 33 1/2
Am. Ship, com.. 70 1/2 - 72 1/2	Nat. En. & Stm., com. 29 1/2 - 31
Am. Steel Fdries. 56 1/2 - 59	Nat. En. & Stm., pref. 90 1/2 - 94 1/2
Bald. Loco., com. 50 1/2 - 57	N. Y. Air Brake. 132 1/2 - 135
Bald. Loco., pref. 99 1/2	Nova Scotia Steel 91 - 91 1/2
Beth. Steel, com. 125 - 131	Pressed Stl., com. 70 - 73 1/2
Beth. Steel, class B 116 1/2 - 123 1/2	Pressed Stl., pref. 101 - 102 1/2
Beth. Steel, pref. 121	Ry. Steel Spring, com. 45 - 48 1/2
Cambria Steel... 113 - 113 1/2	Ry. Steel Spring, pref. 96 1/2 - 97
Carbon Stl., com. 85 - 90	Republic, com. .. 76 - 81 1/2
Case (J. I.), pref. 84	Republic, pref.. 100 1/2 - 101 1/2
Central Fdry., com.... 23 1/2	Sloss, com. 46 1/2 - 51
Central Fdry., pref. 40 1/2 - 44	Superior Steel... 33 1/2 - 36 1/2
Charcoal Iron, com. 6 1/2 - 7 1/2	Un. Alloy Steel.. 41 1/2 - 41 1/2
Chic. Pneu. Tool 68 - 68 1/2	U. S. Pipe, com.. 18 1/2 - 19 1/2
Colo. Fuel 45 - 48	U. S. Pipe, pref. 54
Cruc. Steel, com. 59 - 67 1/2	U. S. Steel, com.. 112 1/2 - 117 1/2
Cruc. Ste d., pref. 104 - 105 1/2	U. S. Steel, pref. 116 1/2 - 117 1/2
Deere & Co., pref. 99 1/2 - 100	Va. I. C. & Coke. 61 - 65 1/2
Driggs-Seabury . 67 - 70	Warwick 9
Gen. Electric... 150 1/2 - 154	Westing. Elec... 45 1/2 - 48 1/2
Gt. No. Ore Cert. 29 1/2 - 31 1/2	
Gulf States Steel 116 - 123	
Gulf S. Steel, 1st pref. 107	

American Steel Foundries Report

The American Steel Foundries continues to make a fine showing. Its net earnings for the first quarter of 1917 were \$3,104,814, and the surplus, after deducting all charges, was \$2,401,402. The following table shows earnings for the corresponding months of the previous years:

	1917	1916	1915
Net earnings.....	\$3,104,814	\$783,707	\$889,736
Other income	75,164	23,835	13,278
Total income	\$3,179,978	\$807,542	\$903,014
Charges, etc.	778,576	311,932	179,842
Surplus	\$2,401,402	\$495,610	\$723,172

Deficit.

Superior Steel Company's Report

The income account of the Superior Steel Company, a Pennsylvania corporation, for the year ended May 31, 1916, and the six months and 26 days, ended Dec. 26,

1916, and of the Superior Steel Corporation, a Virginia corporation, for the period from Dec. 27 to 31, 1916, as filed with the New York Stock Exchange, shows the following:

	Year Ended May 31, 1916	Seven Months Ended Dec. 31, 1916
Total sales	\$5,010,250	\$4,153,577
Manufacturing cost	3,660,850	2,506,107
Selling and administrative expenses, etc.	175,731	155,056
Interest received less interest paid.....	\$1,173,668	\$1,492,413
Net profits	\$1,181,577	\$1,504,598

Midvale Steel Report

The report of the Midvale Steel & Ordnance Company and subsidiaries, for the quarter ended March 31, shows even a greater rate of earnings than recorded prior to Jan. 1, 1917. The first annual report of the company indicated net earnings of \$35,775,000 for the year ended Dec. 31, 1916. The statement for the past quarter is as follows:

Earnings before charging interest on bonds, mortgages and guaranteed stock of subsidiary companies, also reserves for federal taxes.....	\$15,859,738
Deduct—Reserves for federal taxes...	1,636,755
Less—Interest on bonds, mortgages and guaranteed stock of subsidiary companies	\$242,756
Interest on M. S. & O. Company bonds outstanding	571,700
Balance of earnings.....	13,408,527
Less reserved for depreciation.....	1,381,840
Net profit	\$12,026,687

Dividends

The Driggs-Seabury Ordnance Corporation, quarterly, 1 1/2 per cent and extra 1 1/2 per cent on the first preferred, and 1 1/2 per cent on the second preferred.

The General Electric Company, quarterly, 2 per cent, payable July 14.

The Maxwell Motor, Inc., quarterly, 2 1/2 per cent on the common, 1 1/2 per cent on the first preferred and 1 1/2 per cent on the second preferred, all payable July 2.

The Niles-Bement-Pond Company, quarterly, 3 per cent on the common, payable June 20, and 1 1/2 per cent on the preferred, payable May 20.

The Pratt & Whitney Company, quarterly, 1 1/2 per cent on the preferred, payable May 21.

The Youngstown Sheet & Tube Company, quarterly, 2 per cent and extra 3 per cent on the common, and 1 1/2 per cent on the preferred, all payable July 1.

Importers and Makers of Ferromanganese Cooperate with the Government

At a recent meeting of the importers of ferromanganese, located in New York and Philadelphia and held at the office of Crocker Brothers, Forty-second Street Building, New York, steps were taken to cooperate with the steel committee of the Council of National Defense as to adequate supplies of this important alloy for the steel industry. A. A. Fowler, resident manager Rogers, Brown & Co., New York, was chosen to represent the importers on the steel committee. As a representative of the producers of ferromanganese in the United States, E. J. Lavino of Philadelphia was also appointed on this committee. As announced elsewhere, steps are now being taken to have the stocks and the needs of steel makers for ferromanganese and to expedite shipments from England as much as possible.

The Curtiss Aeroplane & Motor Corporation, New York, has taken an additional order from the British Government for aeroplane motors and parts. The new order amounts to \$15,000,000, making the total now on the books of the company for the British Government \$30,000,000. This business will not interfere with the carrying out of contracts for the United States Government. The Curtiss plant has been inspected and approved by officials of the United States Army Board, and the Government has an option on the company's production for the next nine months amounting to \$35,000,000.

New Commission Will Not Fix Prices

All Buying to Be Done for Governments of United States and Entente Allies by Joint Agreement — Competitive Bidding to Be Eliminated

WASHINGTON, May 15, 1917.—A joint agreement, the parties to which will be the governments of the United States and the Entente Allies, providing for the appointment of a commission empowered to purchase all the war material of every description that may be bought by these governments in the United States, is now being formulated by Secretary of the Treasury McAdoo. According to the present plan, this agreement will be simultaneously submitted to all the signatory parties and the exchange of ratifications is expected to take place within a month or six weeks. The personnel of the commission, it is understood, will be limited to Americans and the general direction of the buying operations may be vested in a single commissioner.

The objects sought in the appointment of this commission, which will handle the most colossal operations ever undertaken by any government or private organization, include the elimination of competitive bidding for iron and steel products, explosives, clothing, food stuffs, and all other supplies required by the armies of the United States and the Allies, the guaranteeing to the producers of living profits, the standardization of methods of purchasing and inspection, the simplification of distribution and transportation and other collateral aims bearing upon the equitable allotment among the allied armies of the American output of war material.

The expenditures to be made by the proposed commission will include a part, if not all, of the immense appropriations, aggregating several billion dollars, to be made by Congress on account of the war, practically all of the American loans to the Allies, which may amount to three billion dollars before the end of the present war, and probably another two or three billion dollars of the money of the Allies already planned to be spent in this country. It is, therefore, apparent that the commission may supervise operations aggregating eight or ten billion dollars per annum.

No interference by the commission with the detailed work of the purchase of supplies for the American army and navy, as now being conducted by the War and Navy Departments, is contemplated at the outset, but it is expected that the commission will exercise a general supervision over these purchases and ultimately will be consulted as to all new contracts that may be made. No attempt will be made to modify existing contracts or to divert from present destination any material actually ordered either for the American Government or for those of the Allies.

Elimination of Bidding

With a view to allaying the apprehensions of manufacturers and dealers, it is semi-officially announced that the commission will not undertake to fix prices in the ordinary sense of that term. The elimination of competitive bidding by representatives of the allied governments will, of course, have a marked effect upon prices, but there will still remain the great factor of demand for private purposes and the opinion is expressed by Government officials that the only important effect of the commission on the market will be to prevent further advances and generally to stabilize prices. While competition will be restricted, there will be no reduction in demand. On the contrary, through the standardizing of methods, it is expected that the commission will be able to utilize to better advantage the producing facilities of all industries contributing war supplies and thus an actual increase in output is looked for.

The feature of the proposed agreement limiting the membership to Americans is based upon the equity

growing out of the fact that the Government of the United States is entitled to consider its own needs first and to insist that they shall be supplied before the resources of the country are drawn upon by other governments, and that the people of the United States are supplying the bulk of the money to be expended by the commission. The familiarity of American officials with the industrial resources of this country also makes it important that they should have the exclusive direction of the proposed expenditures. The Allies will benefit greatly, it is pointed out, by the elimination of competition, which should reconcile them to placing their interests unreservedly in the hands of American commissioners.

The announcement that the commission will not undertake to fix prices is highly significant, but it is in line with other recent developments in this connection. The utilization by Secretary Daniels of certain provisions of the national defense law and the last naval appropriation act to compel manufacturers to supply the Government at prices far below the market, if not below cost, under penalty of having their plants seized and operated by the Government, has reacted strongly in the minds of many administration officials and the results are already apparent in the attitude of the Council of National Defense and other officials toward producers. The discussion at the Capitol of the provisions of the pending war revenue bill with its heavy taxes on incomes and profits and the depressing effect upon many industries of the outlook for heavy imposts during the period of the war have admonished executive officers that manufacturers must be fairly treated by the Government if their efficiency and spirit of co-operation are to be maintained. Unless the industries are prosperous there will be nothing to tax, for obviously the Government cannot support a war by confiscatory methods that must speedily bring about widespread ruin.

Sub-committees Appointed

An attempt has been made during the past week to improve the co-ordination of the various committees acting under the supervision of the Advisory Commission of the Council of National Defense. Much confusion has arisen as the result of the irregular methods pursued in the announcement of these subcommittees, a few of which have been given out here while others have been made public at various other points by members supplied with tentative lists of persons whose acceptance of appointments had not yet reached the Advisory Committee. The Council of National Defense has officially furnished the correspondent of THE IRON AGE with the following list of subcommittees under the Committee on Raw Materials, Minerals and Metals, of which Bernard M. Baruch is chairman:

Aluminum: Chairman, Arthur V. Davis, Aluminum Company of America, Pittsburgh; E. E. Allyn, Aluminum Castings Company, Cleveland; Joseph A. Janney, Janney, Steinmetz & Co., Philadelphia.

Asbestos, Magnesia and Roofing: Chairman, Thomas F. Manville, H. W. Johns-Manville Co., New York.

Brass: Chairman, Charles F. Brooker, American Brass Co., Ansonia, Conn.; E. O. Goss, Scoville Mfg. Co., Waterbury, Conn.; Burton Haselton, Rome Brass Co., Rome, N. Y.; Lewis H. Jones, Detroit Copper & Brass Co., Bridgeport, Conn.; F. J. Kingsbury, Bridgeport Brass Co., Bridgeport, Conn.

Coal Tar By-Products: Chairman, William H. Childs, The Barrett Company, New York.

Lead: Chairman, Clinton H. Crane, St. Joseph Lead Co., New York; Fred. Bradley; Edward Brush, American Smelting & Refining Co., New York; E. J. Cornish, National Lead Co., New York; Harry L. Day; F. Y. Robertson, U. S. Metals Refining Co., New York.

Steel: Chairman, L. W. Kingsley, Eugene Munsell & Co., New York.

Nickel: Chairman Ambrose Monell, International Nickel Co., New York.

Steel and Steel Products: Chairman, Elbert H. Gary, U. S. Steel Corporation and American Iron and Steel Institute, New York; James A. Burden, Burden Iron Co., Troy, N. Y.; E. A. S. Clarke, Lackawanna Steel Company, New York; Alva C. Dinkey, Midvale Steel & Ordnance Company, Philadelphia; James A. Farrell, United States Steel Corporation, New York; Willis L. King, Jones & Laughlin Steel Co., Pittsburgh; Charles M. Schwab, Bethlehem Steel Corporation, New York; John A. Topping, Republic Iron & Steel Company, New York.

Zinc: Chairman, Edgar Palmer, New Jersey Zinc Company, New York; Charles W. Baker, American Zinc, Lead & Smelting Co., New York; A. P. Cobb, New Jersey Zinc Co., New York; Sidney J. Jennings, United States Smelting & Mining Co., New York; Cornelius F. Kelley, Anaconda Copper Company, New York; N. Bruce MacKelvie, Butte & Superior Copper Co., New York; Thomas F. Moon, Illinois Zinc Co., Peru, Ill.; Charles T. Orr, Bertha A. Mining Company, Webb City, Mo.

Other committees are on alcohol, lumber, oil, sulphur, coal production, wool, acids and chemicals. The Advisory Committee also has nominated but not yet confirmed a subcommittee on pig iron, iron ore and lake transportation, as follows:

Chairman, H. G. Dalton, Pickands, Mather & Co., Cleveland; Leonard Peckitt, president Empire Steel & Iron Company, Catsauqua, Pa.; J. H. Woodward, president Woodward Iron Company, Woodward, Ala.; W. T. Shepard, Rogers, Brown & Co., Buffalo; F. B. Richards, M. A. Hanna & Co., Cleveland; Frank Billings, Tod-Stambaugh Company, Cleveland; Harry Coulby, president Pittsburgh Steamship Company, Cleveland.

The membership of this subcommittee was prematurely announced from Pittsburgh during the past week, presumably by one of its members who was not advised that the selections were tentative until approved by the Advisory Committee. Formal approval of this subcommittee will probably be announced within a day or two.

Chairman Francis S. Peabody of the Committee on Coal Production has issued an address to the coal operators of the United States in which he urges co-operation in the mobilization of the resources of the country and the necessity at the present time of maintaining fuel production at the maximum.

Committee of Fabricators to Help Government

A special committee of six members of the Bridge Builders & Structural Society has been appointed as a result of a resolution passed at a meeting of the society held in Chicago on May 11, "to co-operate with the several departments of the Government and with all commissions, committees and parties connected with furnishing supplies to the Government, to the end that the facilities of the fabricating plants of the country may be most efficiently utilized." The resolution was passed because "it is already apparent the Government will need directly and indirectly large amounts of fabricated steel," and that "prompt delivery of such steel is of the highest importance and such delivery cannot be made without systematic co-operation and organization of the industry."

The amount of fabricated business put under contract in April, according to the figures collected by Secretary George E. Gifford of the society, is no less than 61 per cent. This corresponds to about 110,000 tons, compared with about 122,000 tons in March, 106,000 tons in February and 110,500 tons in January.

The Reading Carwheel Company, Reading, Pa., has received an order for 15,000 wheels to be made during the next five months. The following corporations will build the cars: Pullman Company, Pullman, Ill., 500 box cars; American Car & Foundry Company, Berwick, Pa., 500 box cars; Pressed Steel Car Company, Pittsburgh, 500 gondolas; Standard Steel Car Company, Butler, Pa., 500 gondolas.

COST OF DOING BUSINESS

Reported to the National Pipe and Supplies Association Meeting Last Week

The cost of doing business in 1916 and the business outlook came in for special attention at a meeting of the National Pipe and Supplies Association in Philadelphia, at the Bellevue-Stratford Hotel, May 9 and 10. Secretary George D. McIlvaine, Oliver Building, Pittsburgh, presented a statement based on 73 reports received. According to this 49 reports, with interest charges on both borrowed money and capital included, showed an average gross profit of 26.13 per cent, presumably on the volume of business. The cost of doing business averaged 18.08 per cent and an average net profit of 8.05 per cent was shown. The cost of doing business over a number of years is as follows:

1909.....	13.60	per cent	1913.....	16.74	per cent
1910.....	14.62	" "	1914.....	16.59	" "
1911.....	15.20	" "	1915.....	19.16	" "
1912.....	15.77	" "	1916.....	18.08	" "

An interesting sidelight on the cost of doing business in relation to the volume of business was also contributed by Secretary McIlvaine. Tabulated it is as follows:

Number of Reports	Volume of Business	Average Cost of Business, Net Including Interest Charges
9	Under \$250,000	16.416
10	\$250,000 to \$400,000	16.76
16	400,000 to 600,000	16.33
10	600,000 to 800,000	13.86
4	800,000 to 1,000,000	17.79
16	Over \$1,000,000	13.26

In comparing the volume of business for the first four months of 1917 with the first four months of 1916, it was shown, the secretary stated, on the basis of letters from 72 houses, that the volume was 39.83 per cent greater in point of money, not tonnage.

One of the features of the meeting was an address by James Francis Burke, ten years a representative in Congress from Pennsylvania, who spoke at length on the Liberty Loan. In this connection mention may be made of a telegram received from N. O. Nelson, at New Orleans, of the N. O. Nelson Mfg. Company, St. Louis, suggesting that members subscribe for the Liberty bonds on the basis of 2 per cent of the capital stock employed in their company.

Addresses were made on the business outlook by J. J. Kennedy, National Tube Company; W. E. Manning, Youngstown Sheet & Tube Company; John Duncan, vice-president and general sales manager, Wheeling Steel & Iron Company, who suggested the probability of another early advance in pipe because of the high prices for pig iron and billets; by James T. Conran, Standard Sanitary Mfg. Company, who stated that the price of enameled ware had advanced 25 per cent over the prices of 1915, while the cost advances had been in greater proportion; by L. M. Johnston, A. M. Byers & Co., Pittsburgh, and by Clarence V. Kellogg, who stated that the Central Supply Association will hold its meeting in Detroit on June 13 and 14.

Officers were elected as follows:

President, L. C. Huesman, Central Supply Company, Indianapolis.

First vice-president, George V. Denny, Georgia Supply Company, Savannah, Ga.

Second vice-president, R. S. Woodruff, C. S. Mersick & Co., New Haven, Conn.

Secretary-treasurer, George D. McIlvaine, 908 Oliver Building, Pittsburgh.

Executive Committee: W. E. Clow, Jr., James B. Clow & Sons, Chicago; George B. Limbert, George B. Limbert & Co., Chicago; J. B. Rahm, United States Supply Company, Omaha; J. S. Simmons, John Simmons Company, New York; Frank M. Sheldon, Braman, Dow & Co., Boston; C. J. Clark, Hunter & Dickson Company, Philadelphia; I. F. Young, Young & Vann Supply Company, Birmingham.

Advisory Board: A. B. Pierce, N. O. Nelson Mfg. Company, St. Louis; W. M. Pattison, W. M. Pattison Supply Company, Cleveland; A. E. Ford, Ford & Kendig Company, Philadelphia.

Hill, Clarke & Co., 125 North Canal Street, Chicago, after June 1 will be located in a new salesroom at 625 West Washington Boulevard.

PLANS FOR BUILDING SHIPS

Administration Measure Added as Amendment to War Budget Bill

WASHINGTON, May 15, 1917.—The Administration's bill providing funds for the construction, under the supervision of the Federal Shipping Board, of a great fleet of wooden and steel cargo vessels, was to-day added as an amendment to the war budget bill which, late this afternoon, was reported by the Senate Committee on Appropriations. This huge appropriation bill, carrying a greater sum than was ever authorized by any budget measure in this or any other country, adds \$562,932,600 to the House bill, making a grand total of \$3,390,486,381. Of the amount added by the Senate Committee, the sum of \$405,000,000 is specifically appropriated for the use of the Shipping Board and the allotment of a further sum of \$350,000,000 at the session of Congress beginning next December is foreshadowed.

Broad powers are conferred upon the President and through him upon the General Manager of the Emergency Fleet Corporation organized by the Shipping Board, but this authority falls far short of that specified in recent sensational reports in the daily press to the effect that the entire output of the steel mills of the country, with the exception of a small amount to meet the minimum requirements of the railroads, would be commandeered for use in the building of steel cargo ships. The President is authorized in addition to all other existing provisions of law, within the limits of the amounts herein authorized, to place an order with any person for such ships or material as the necessities of the Government, to be determined by the President, may require. The bill provides that "compliance with all such orders shall be obligatory on any person to whom such order is given, and such order shall take precedence over all other orders and contracts except those intended to supply the Army and Navy of the United States theretofore placed with such person. If any person owning, leasing, or operating any factory equipped for the building or production of ships or material shall refuse or fail to give to the United States such preference in the execution of such order, at such reasonable price as shall be determined by the President, he may take immediate possession of any factory of such person, or any part thereof without taking possession of the entire factory, and may use the same at such times and in such manner as he may consider necessary or expedient."

Plans for Building Ships

The Shipping Board has just announced the signing of the first contract for steel ships for the cargo fleet, which has been awarded to the Los Angeles Shipbuilding & Dry Dock Company. It covers eight vessels of 8800 tons each to be delivered in 1918, two in May, two in June, two in September and two in October. Details of purchase price, etc., have not been disclosed.

The board also announces that negotiations are now on foot for the construction of 250,000 tons of ships, chiefly wooden vessels, but including a number of steel ships. It is predicted that before the end of 1918, 1000 ships aggregating more than 3,000,000 gross tons will be launched as the result of contracts to be made during the next three or four months. Officials of the Shipping Board stated to-day that it will not be the policy to make public the names of contractors who may secure awards for the construction of vessels. An exception was made in the case of the Los Angeles Shipbuilding & Dry Dock Company, which received the first contract for steel ships of a standardized type developed on the Pacific coast and found to be economical and in other ways entirely satisfactory.

Large Freighters Bought

By direction of President Wilson, Chairman Denman of the Shipping Board, has purchased seven large freight ships of the Austro-American Steamship Line, having a total cargo capacity of 52,600 tons. These vessels are among the 14 Austrian ships interned in

United States ports. The price paid was \$6,678,006 or \$148.64 per ton. These ships can be used in either coastwise or foreign trade, but it is understood will be employed for carrying foodstuffs and war material to the Allies.

A bulletin issued by the Navy Department announces that the first of the new submarine chasers being built by the Government has been launched at the New York Navy Yard. The keel of this vessel, which is of the 110 foot type, was laid on April 1, but as much work yet remains to be done, it will not be ready for use before June 15. The second chaser will be put in the water at the New Orleans Navy Yard within the next 10 days. A very considerable fleet of these craft will be completed by the navy yards and by private shipbuilders within the next 60 days and more will follow rapidly.

The permanent committee on the tin can supply, operating under the supervision of the Departments of Commerce and Agriculture, and the Council of National Defense, has decided to take over control of the distribution of tin cans, which will be released and shipped only upon the approval of the committee. As the leading tin can manufacturers and producers of tin plate are fully represented on the committee and approve the action determined upon, no opposition from any quarter is expected. The chief object of the committee will be to limit the distribution of cans to packers of perishable products, and other manufactureres heretofore employing tin will be urged to use glass, fibre, paper and other materials for containers.

American Iron and Steel Institute Meeting

The twelfth general meeting of the American Iron and Steel Institute will be held in the grand ball-room of the Waldorf-Astoria, New York, Friday and Saturday, May 25 and 26. On Friday there will be sessions in the forenoon and afternoon and evening. Saturday will be devoted to seeing New York. After the noon session Friday, members will be guests of the institute at a buffet luncheon. In the evening, there will be a banquet.

The meeting Friday morning will be opened by an address by the president of the institute, Judge Elbert H. Gary, after which the following papers will be read and discussed:

Recent Installations of Large Turbo Generators, by Richard H. Rice, engineer General Electric Company, West Lynn, Mass.

The Chemical Reactions of Iron Smelting, by Walther Mathesius, superintendent blast furnace, Illinois Steel Company, South Chicago.

The Manufacture of Steel Castings, by Robert P. Lamont, president American Steel Foundries, Philadelphia.

The Relative Merits of Forming Steel by Pressing, Hammering or Rolling, by John Lyman Cox, engineer Midvale Steel Company, Philadelphia.

Surgical Discoveries of the War and Their Application to Industrial Accidents, Humanitarian and Economic Features, by Dr. William O'Neill Sherman, chief surgeon Carnegie Steel Company, Pittsburgh.

Locomotive Orders

Orders for locomotives in the past week have been 74. Of these the Baldwin Locomotive Works will furnish 25 switching engines to the Great Northern and 35 locomotives to the Pennsylvania Lines West, these being in addition to the 35 ordered by the same railroad last week from the American Locomotive Company. Miscellaneous orders make up the remainder of the 74, of which 9 are going to a Russian mining company from the Baldwin Locomotive Works. The 65 locomotives which the Chicago, Burlington & Quincy was reported as inquiring for last week are said to have been taken by the Baldwin Locomotive Works, but this has not been definitely confirmed. Besides these the New York Central is in the market for 75 locomotives for delivery in 1918, the Southern Railroad for 25, Santa Fe and the Norfolk & Western for 30 Mallet locomotives. Orders in May up to and including May 12 are estimated at 183, bringing the total for the year to that date to 1860. Of these 531 are reported as foreign orders.

SUBSCRIBES TO LIBERTY LOAN

Pittsburgh Company Helps Men Do Their Bit—
News from Labor Field

The Harbison & Walker Refractories Company, Pittsburgh, has subscribed \$1,000,000 to the Liberty Loan, half of this amount for the company, and \$500,000 for account of its employees. Exact plans by which the \$500,000 subscribed for by the company for its employees have not been worked out, but it is its intention to underwrite this amount of the bonds for its employees, most of whom will probably pay for the bonds in partial payments. Officials will likely take the larger amounts, and pay cash for them. The company believes that by doing this it will stimulate interest in subscribing to the bonds, and will provide a plan by which even the lowest salaried employee will be able to secure a minimum amount of the bonds, and all can obtain as large amounts as they feel able to pay for in the manner proposed.

An increase in wages, effective May 1, was made at both the coke oven and blast furnace plants of the By-Products Coke Corporation, Chicago, this being the fourth advance since February, 1916.

About 4000 carpenters in the Pittsburgh district, who were out on strike since May 1, returned to work last week. Where the pay was \$5, it becomes \$5.68 a day. Overtime pay, time and a half for overtime, and double time for work after midnight, Sundays and holidays, remains that way, the representatives of the men waiving a demand for double time for all overtime work.

Last week a wage agreement was signed at Youngstown, Ohio, by which electrical firms in the Youngstown district will pay journeymen \$5 per day, from Aug. 1, 1917, to April 1, 1918. The increase from \$4.60 to \$5 per day was made by the employers voluntarily because of the increased cost of living.

The American Locomotive Company has given employees at its Pittsburgh works a 9-hour day, with the same rate of pay the men have been receiving for a 10-hr. day. The company also decided to give its employees a bonus of 5 per cent on their earnings, under certain conditions. The advanced rate of wage went into effect Monday, May 7, and affects nearly 1000 men.

Blast furnaces and steel mills in the Mahoning and Shenango valleys increased wages about 10 per cent, effective May 1. Blast furnace labor is on the basis of 3.02½ per day, the highest rate ever known.

The Boston union rate for molders and coremakers is now \$4.50, dating from May 1. The workmen asked for an 8-hr. day, but the 9-hr. day is continued. The original demand was made in March and the minimum for molders and coremakers was increased from \$4 to \$4.25 from April 1, with the stipulation of an additional advance of 25 cents May 1.

For some time a demand on the union jobbing foundries of Chicago has been pending, involving an advance from \$4 to \$5 a day as minimum for molders and coremakers. The demand made in the spring of 1916 was for an increase in the minimum from \$4 to \$4.50 per day of 9 hr. The foundrymen voluntarily offered an 8-hr. day with no change in wages and the union accepted this. The latest demand, therefore, involves the 50-cent increase asked for last year, and an additional increase of 50 cents. All the larger foundries of the Chicago district are open shops, not recognizing a minimum rate and operating on the basis of a 9-hr. day or in some cases a 55-hr. week, with Saturday half holiday.

On May 1 an increase of 10 per cent was granted all employees of the Wisconsin Steel Company, South Chicago, Ill.

On the ground that the Orbon Stove & Range Company, Belleville, Ill., had discriminated against union employees, the local union of Stove Mounters and Steel Range Workers is on strike. The strike spread to foundry laborers, necessitating the laying off of molders, which caused a shutdown of practically all the foundries in Belleville.

Between 2000 and 3000 men were affected, although the stove workers number only about 500.

Between 500 and 600 Muncie, Ind., machinists have struck, demanding an 8-hr. day and 20 per cent wage increase.

OBITUARY

WILLIAM H. CASSIDY, aged 77, one of the oldest former iron and steel manufacturers in the Pittsburgh district, died Monday evening, May 14. In the early 80's, with David B. Oliver, former United States Senator George T. Oliver, Dr. C. Evans, the late Henry W. Oliver and the late James B. Oliver, he formed the Oliver & Roberts Wire Company, Pittsburgh, of which he was treasurer until that company sold out in 1889 to the Consolidated Steel & Wire Company, this concern being taken over in 1901 by the American Steel & Wire Company. At that time he retired from active business.

B. H. SANDERS, president of the American Foundry & Mfg. Company, St. Louis, Mo., died May 13 at his home from a complication of diseases. Mr. Sanders was born in St. Louis in 1865 and for many years worked as a journeyman in foundries. He formed the company of which he was the head in 1893. He was a member of the Brass Trades Association, the National Metal Trades Association and the American Foundrymen's Association.

JOHN C. SIMMS, aged 41, died at his home in Pittsburgh, Wednesday, May 9. Mr. Simms was president and treasurer of the Machinists Supply Company, Pittsburgh, for 14 years. His early days were spent in Chicago, and his first connection in the supply business was with the Machinists Supply Company of Chicago, where he was employed for 10 years before going to Pittsburgh to take charge of the Machinists Supply Company.

GILBERT T. RAFFERTY, for many years prominently identified with the coke business and other interests in Pittsburgh, died Monday, May 7. Following his retirement as president of the McClure Coke Company in 1895 he traveled extensively and maintained homes in Pittsburgh, New York and Alexandria Bay.

ELLIOTT W. TAYLOR, aged 34, the Pittsburgh manager of sales for the Armstrong Cork & Insulating Company, died in the Municipal Hospital in Pittsburgh, May 12. He was a graduate of the University of Maine, and taught for several years in the Massachusetts Institute of Technology.

RICHARD R. ELLIS, 50 years old, superintendent of the Detroit Forging Company, died May 6 at his home in Detroit. Mr. Ellis went to Detroit 14 years ago to take charge of the Detroit Forging Company's plant, and was largely responsible for building it into a large business.

WILLIAM H. HUGUS, aged 66, superintendent of the Davidson works of the H. C. Frick Coke Company, at Connellsville, Pa., died on May 9, at Atlantic City, N. J. He was born in Delmont, Pa. He retired from active business eight years ago.

What is called an "Outline of Metallurgy of Iron and Steel" has been drawn up in the shape of a diagram of the highly informative and educational sort capable of being hung on the wall. It has been compiled by Frank E. Sanborn, director of the Industrial Arts Department of Ohio State University, Columbus, and a copy in blueprint form may be obtained for 25c. by applying to him. From the diagram one may obtain at a glance an idea of the processes employed and the steps in the processes in the making of any particular product. The electric furnace, the duplex process and the air furnace are included.

PERSONAL

Charles R. Holton has been appointed assistant purchasing agent of the Bethlehem Steel Company, South Bethlehem, Pa. Until early in 1916, he was private secretary of J. V. W. Reynders, vice-president of the Pennsylvania Steel Company at Steelton, Pa., and in the past year has been assistant to W. M. Tobias, purchasing agent of the Bethlehem Steel Company.

Ward Harrison, illuminating engineer National Lamp Works, General Electric Company, Nela Park, Cleveland, is to address the Illuminating Engineering Society at the rooms of the Western Society of Engineers, Monadnock Building, Chicago, on Friday evening, May 18, on "Something New in Industrial Lighting."

F. C. Smink, president of the Reading Iron Company, Reading, Pa., has been elected president of the Blandon Rolling Mill Company, recently organized to operate the old mill at Blandon, Pa., which was built in 1867 and enlarged and improved in later years. It has an annual capacity of 30,000 to 40,000 tons of grooved pipe skelp and miscellaneous iron products. The mills have been operated the past 20 years under an individual partnership, but owing to the death of one of the partners it was decided to incorporate the Blandon Rolling Mill Company.

L. H. Mesker, who has been representing the Kearney & Trecker Company, Milwaukee, Wis., in the Cleveland territory, has resigned to become connected with the sales department of The Cleveland Milling Machine Company.

James Ashton, metallurgical engineer A. M. Byers Company, Pittsburgh, read a paper on "Wrought Iron Pipe for Use in the Natural Gas Field" before the Natural Gas Association of America at Buffalo this week.

J. A. Lovington of the engineering department of the American Ore Reclamation Company, New York, has joined the officers' training camp at Plattsburg, N. Y. He holds a commission as second lieutenant in the Engineers' Reserve Corps and he was formerly a member of the 22d Regiment of Engineers, National Guard of New York.

George Mitchell, Pittston Stove Company, Pittston, Pa., was re-elected president of the Stove Founders' National Defense Association at its annual meeting held in Chicago on May 8, and he was voted \$5,000 in recognition of his valuable service in behalf of the association. Lewis Moore, Joliet, Ill., was elected first vice-president; Joseph L. Anthony, Taunton, Mass., second vice-president; Robert W. Sloan, Pittston, secretary, and William A. Dwyer, Detroit, treasurer.

F. H. Tackaberry, for some time sales agent in Mexico for the Pennsylvania Steel Company, and later assistant general manager of sales of the Pennsylvania Steel Company, and now identified with the Ordnance Engineering Company, New York, will join the American Steel Export Company on May 21 and will travel in South America.

H. E. Bauer, for some years associated with the New York sales office of the Republic Iron & Steel Company, has taken a special sales position with J. K. Larkin & Co., who maintain steel warehouses in New York and Brooklyn, specializing in wrought pipe, bars, nuts, rivets, spikes, nails, chains, etc.

Boris V. Constantinov, mechanical engineer, 29 Broadway, New York City, for about nine years in the engineering department of the Crane Company at Bridgeport, Conn., and who has established himself in the business as a representative of American companies to distribute products in Russia, plans shortly to visit Russia, where he has a brother in charge of the Russian end of the business.

James A. Farrell, president of the United States Steel Corporation, was leading speaker at a patriotic rally held recently in Greenville, Pa. Three thousand employees of the Bessemer & Lake Erie Railroad

shops, the Carnegie Steel Company, and other industries marched in a preparedness parade.

Thomas Morrison, of Pittsburgh, a director of the United States Steel Corporation, has been appointed a director of the International Nickel Company.

Shirley S. French, formerly manager of the William Tod Company, Youngstown, Ohio, a subsidiary of the United Engineering & Foundry Company, has resigned to become assistant to President W. H. Foster, of the General Fireproofing Company, assuming his new duties June 1. Mr. French was with the William Tod Company about two years, previously having been with the Brier Hill Steel Company.

Charles H. Booth has resigned as chairman, and also as a member of the executive committee of the United Engineering & Foundry Company, Pittsburgh, largely because of ill health. He will continue to be a director of the company. Mr. Booth has been connected with the manufacture of iron and steel works, tin plate and sheet mill equipment for many years. His father, the late Lloyd Booth, founded the original firm of Lloyd & Miller, which later became the Lloyd Booth Company, and some years ago its plant was acquired by the United Engineering & Foundry Company, and was known as the Lloyd Booth works. It is said the Lloyd Booth Company was the first in the United States to develop and build tin plate equipment. Mr. Booth has served as a member of the administrative council of the National Founders' Association.

Julian Kennedy, consulting engineer, Bessemer Building, Pittsburgh, has been appointed a member of the state committee of public safety by Governor Brumbaugh of Pennsylvania.

W. J. Barnum has been placed in charge of the legal bureau of the new Industrial Relations Department of the Youngstown Sheet & Tube Company, Youngstown, Ohio, of which Dudley R. Kennedy is the head.

George W. Goethals announces his association with Charles C. Jamieson, Robert E. Graham, George H. Houston, John C. Jay, Jr., and George M. Wells, consulting engineers, 40 Wall Street, New York. The name of the company will be Goethals, Jamieson, Houston & Jay, Inc.

Thomas Benson, who has been elected vice-president and general manager of the Maryland Shipbuilding Company, Baltimore, recently organized, has had wide experience in ship construction. He is a native of Wilmington, Del., and entered the yards of the Harlan & Hollingsworth Corporation as an apprentice. Later he became general superintendent of the shipyards. He was with the company for 25 years. He then became chief engineer of the floating equipment of the Baltimore, Chesapeake & Atlantic and the Maryland, Delaware & Virginia railways. About a year ago he was made president of the Standard Shipbuilding Company of New York. These yards were recently sold to Cuban interests headed by Jose Marimon.

C. E. Thomas, manager credit department, United States Steel Products Company, is one of the speakers on "Foreign Credits" at the meeting of the New York Credit Men's Association to be held at the Hotel Astor, Thursday evening, May 24.

Frank F. Amsden has returned to Harrisburg, Pa., and is now in charge of Lochiel furnace, recently purchased by E. E. Marshall, which is being made ready for the production of ferromanganese and spiegeleisen. Mr. Amsden will also have charge of other plants of the Marshall interests.

H. A. Whitaker, associated with the Cambria Steel Company, has been appointed general superintendent of the Midvale Steel & Ordnance Company, Coatesville, Pa., succeeding Harry I. Schotter, resigned.

The United Engineering & Foundry Company has formed a district of its Youngstown plants, and G. F. Knotts has been made district manager. He will be assisted by Harvey Kelly, who has the title of general superintendent.

H. R. Keeling, formerly in the publicity department of the Armstrong Cork & Insulating Company, Pitts-

burgh, has resigned to become advertising manager of the Haynes Automobile Company, Kokomo, Ind.

W. C. Munn, employed for the past four years as assistant purchasing agent for the Youngstown Sheet & Tube Co., has resigned to become purchasing agent for the Brier Hill Steel Co., Youngstown, Ohio. He has appointed C. A. Ilgenfritz his assistant. Mr. Munn was with the La Belle Iron & Steel Company at Steubenville before going to Youngstown.

John B. Carse, of the advisory committee of the United States Steel Corporation, 71 Broadway, New York, has been made chairman of the Purchasing Agents Committee of the subsidiary companies.

F. H. Schoenfuß, formerly metallurgical engineer for the Standard Roller Bearing Company, has entered the consulting engineering field at Philadelphia and is specializing on alloy steels.

H. B. Robinson, for many years superintendent of the Allentown Rolling Mills, Allentown, Pa., has joined the mechanical engineering force of the New York Shipbuilding Company and will move to Camden, N. J., this week. He will assist in the designing and construction of the great turbine engines of the new United States battle cruisers.

Robert Barber has been elected a director of the Safety Car Heating & Lighting Company, Jersey City, N. J., to succeed his father, William Barber, deceased.

C. P. Perin, consulting engineer, New York, sailed for England on May 14 for an absence of six or eight weeks. He was accompanied by H. M. S. Tuckwell, of the Tata Iron & Steel Company, India.

J. H. Morris has resigned as auditor of the William Tod Company, Youngstown, Ohio, effective July 1. He has been identified with the Tod Company for four years and prior to that time spent ten years in the accounting departments of the National Steel Company, Carnegie Steel Company, Tennessee Coal, Iron & Railroad Company, Republic Iron & Steel Company, and the Inland Steel Company. His plans for the future are not definitely settled.

Stove Manufacturers' Meeting

The National Association of Stove Manufacturers held its forty-sixth annual meeting at the Congress Hotel, Chicago, May 9 and 10. In his annual address, President Lewis Moore said that "selling prices are not commensurate with the increased cost of the elements entering into the goods," and emphasized that "stove makers have been very conservative and their increases in prices are vastly less than the increases in almost every other line of manufacture. Statisticians and students of commercial economics," he continued, "warn us against extended credits and long terms. The use of trade acceptances is becoming more general and has the support of banking institutions. They work no hardship on the buyer and are of advantage to the seller. They eliminate much of the haphazard lines of least resistance of credit extensions."

He suggested the establishment of a bureau of research and experiment which can be conducted in any one of the several institutions organized for that purpose. "The future of our business," he said, "has problems to be solved which will be better and more quickly worked out through concerted action than by individual effort."

Among the addresses was one on "Electric Stoves," by George Hughes, Hughes Electric & Heating Company, Chicago. He was of the opinion that development in this industry will be slow because of many restrictions imposed upon it and of the need of educating the general public and distributors of power.

New York City was chosen for the 1918 convention. The officers elected were: President, Fred Will, Sill Stove Works, Rochester, N. Y.; first vice-president, Lee W. Van Cleave, Buck's Stove & Range Company, St. Louis; second vice-president, Robert Leach, Weir Stove Company, Taunton, Mass.; treasurer, Charles F. Mertz, Co-operative Foundry Company, Rochester, N. Y.; secretary, F. J. Stephenson, Hoosick Falls, N. Y.

Gear Makers Meet at Pittsburgh

At a meeting of some of the larger gear manufacturers held in Pittsburgh a few months ago, the American Gear Manufacturers' Association was organized with F. W. Sinram of the Van Dorn & Dutton Company, Cleveland, as president, and F. D. Hamlin, Earle Gear & Machine Company, Philadelphia, as secretary. A second meeting of this organization was held in the Hotel Schenley, Pittsburgh, on Monday and Tuesday, May 14 and 15. This meeting was largely attended, the following named companies and their representatives being present:

Bilgram Machine Works, Philadelphia, Hugo Bilgram; Boston Gear Works, Norfolk Downs, Mass., Frank Burgess; Cincinnati Gear Company, Cincinnati, John Christensen and S. I. Sorensen; Crofoot Gear Works, Boston, C. E. Crofoot; Earle Gear & Machine Company, Philadelphia, Frank D. Hamlin and Albert J. Hamlin; Foote Brothers Gear & Machine Company, Chicago, J. B. Foote; Frost Gear & Forge Company, Jackson, Mich., E. J. Frost; William Ganschow Company, Chicago, William Ganschow and Chas. F. Goedke; Gleason Works, Rochester, N. Y., James Gleason and Andrew C. Gleason; Hamilton Gear & Machine Company, Toronto, Can., Chester B. Hamilton; Horsburgh & Scott Company, Cleveland, Frank Horsburgh and R. G. Horsburgh; D. O. James Mfg. Company, Chicago, D. O. James; W. A. Jones Foundry & Machine Company, Chicago, Warren G. Jones; Meisselback-Catucci Mfg. Company, Newark, N. J., Norman E. Zusi; Newark Gear & Machine Company, Newark, Henry E. Eberhardt, Henry J. Eberhardt and Frank E. Eberhardt; R. D. Nuttall Company, Pittsburgh, Milton Rupert, E. T. Causser, W. H. Phillips and J. C. McQuiston; Philadelphia Gear Works, George L. Markland, Russell C. Ball and Robert J. Coulter; Pittsburgh Gear & Machine Company, Pittsburgh, Frank H. Rea, John J. Jackson and J. Clayton O'Brien; Simonds Mfg. Company, Pittsburgh, Biddle Arthur and John Jackson; Van Dorn & Dutton Company, Cleveland, F. W. Sinram, Franklin Schnelder and F. C. J. Awig.

S. L. Nicholson, Westinghouse Electric & Mfg. Company, gave an extemporaneous talk on the subject of "The Ins and Outs of an Industry Organization." He pointed out how the members could be mutually benefited by working together in harmony for the best interests of the new association, which has been formed for the development, standardization and improvement of the gear industry. James E. Gleason, Gleason Works, presented a paper on "The Spiral or Curved Tooth Beveled Gear." Frank Burgess, Boston Gear Works, presented a paper entitled "Industrial, Mill or Job Gearing; to What Extent Can it Be Standardized?" and William Ganschow, William Ganschow Company, discussed the "Advantages of Gear Standardization."

New Officers of the Engineering Society of Buffalo

The Engineering Society of Buffalo, at a meeting held Wednesday evening, May 9, elected the following officers for the ensuing year:

President, F. A. Lidbury, works manager Oldbury Electrochemical Company, Niagara Falls; vice-president, D. W. Sowers, president Sowers Mfg. Company, Buffalo; secretary, F. B. Hubbard, plant engineer Pierce-Arrow Motor Car Company; treasurer, W. M. Dollar; directors, H. B. Alverson, Buffalo General Electric Company, and F. E. Cardullo, Curtiss Aeroplane & Motor Corporation.

A New Steel Export Company

The Pittsburgh Export Company has been formed with headquarters, it is understood, in Pittsburgh. Among those mentioned as prominently identified are Charles J. Graham, vice-president Graham Nut Company, Pittsburgh; Frank J. Lanahan, president and general manager Fort Pitt Malleable Iron Company, and J. R. Flannery, Flannery Bolt Company, Pittsburgh. A New York office is to be established with Mr. Bird, of the Young, Smyth, Field Company, Philadelphia, in charge.

The offices of M. A. Hanna & Co., iron ore, pig iron, coal and coke, B. S. Stephenson, resident manager, have been removed from room 1445 to rooms 1319-1320 Oliver Building, Pittsburgh.

Caring for Government Wire Rope Orders

Manufacturers of wire rope held a meeting in New York Friday, May 11, to canvass the Government's requirements in that product and the means of meeting them. It appeared that the United States Government and its Allies would probably require 24,000 tons of wire rope this year, though the amount first mentioned was 9000 tons, of which France was to get about one-third. A committee was appointed to take charge of the distribution of the Government orders, consisting of Frank Baackes, American Steel & Wire Company; Karl G. Roebling, John A. Roebling's Sons Company, Trenton, N. J., and J. Broderick, Broderick & Bascom Rope Company, St. Louis. It is stated that the industries of the country which are the principal consumers of wire rope will be able to get their requirements as heretofore and that the Government orders will not be at the expense of other consumers. A meeting of the manufacturers of wire is appointed for Friday, May 18, in New York, to apportion to different works the supplying of the wire needed by such manufacturers of wire rope as do not have connected wire mills.

Pittsburgh and Nearby Districts

The National Screw & Bolt Company, which heretofore has been the holding company for the Pittsburgh Screw & Bolt Company, N. S. Pittsburgh, and Gary Screw & Bolt Company, Gary, Ind., is in process of dissolution. The capital stock of the Pittsburgh Screw & Bolt Company has been increased from \$300,000 to \$3,000,000, and of the Gary Screw & Bolt Company from \$400,000 to \$1,000,000. Neither concern has any plans under way for additions to existing plants.

It is stated that during April, new orders of the Westinghouse Electric & Mfg. Company, East Pittsburgh, amounted to \$8,000,000, while shipments were about \$6,000,000. It is said this company is sold up for 18 months or more on some kinds of electrical equipment. The annual report will be issued late this month, and will make the best showing in every way the company has ever made in its history.

The Cambria Steel Company, Johnstown, Pa., has delivered to the Virginian Railway the first of four 120-ton gondola cars ordered by it for experimental use in the coal carrying trade, and Pittsburgh railroad interests are awaiting with much interest the result of the experiments that are to be made with them. These cars are 52 ft. 2½ in. over all, 10 ft. 4¼ in. wide and 11 ft. from rail top to top of sides. In interior dimensions, the cars are 50 ft. long, 9 ft. 8¾ in. wide and 7 ft. 5 in. deep. The cars are carried on six-wheel cast steel trucks.

Because of the shortage of labor, the H. C. Frick Coke Company is serving notice on all small coal operators mining small tracts of coal in the Connellsville region abandoned by the company that their leases will be canceled. Since the coal boom set in, scores of small operations have sprung up, and lessees have been doing a business running into hundreds of dollars a week.

The Pittsburgh Steel Products Company, an interest of the Pittsburgh Steel Company, is adding two units to its seamless steel tubing plant at Monessen, Pa., and has placed an order with the McClintic-Marshall Company for about 3000 tons of structural steel for new buildings. The plant makes all gages and forms of seamless steel tubing from 1 in. to about 6 in. in diameter, and has an annual capacity of about 60,000 tons.

At the present time the Carnegie Steel Company, Pittsburgh, has nine blast furnaces idle, these being Edith, Zanesville, Neville Island, one Bellaire, two Farrell, one Isabella and Steubenville. Two stacks are banked, these being one Edgar Thomson and one Clairton for lack of coke. The nine idle stacks are all undergoing relining and repairs, and will be blown in as fast as they are ready for blast.

The Carnegie Steel Company, Pittsburgh, is in the market for a number of punches and shears for its plants in the Pittsburgh and Youngstown districts.

The Brier Hill Steel Company has lately purchased 40 acres near its open-hearth steel plant in Youngstown, and 17 acres near its sheet mills at Niles, Ohio. This ground was secured for the purpose of making future extensions to its open-hearth steel plant and sheet mills, and the company has also bought recently several hundred acres more of desirable land in the Mahoning Valley industrial district, which it will use later for new plants or extensions to existing works.

It is stated that a number of industrial plants in the Pittsburgh district that formerly made munitions, but which completed their contracts some time ago, will not be dismantled as intended, as they will very likely be called on to make munitions for the United States Government. Included in these are several plants formerly operated by the Westinghouse Electric & Mfg. Company, and other concerns. It is stated that the Erie Forge Company, Erie, Pa., has received a large contract for shells for the Government, and had lately placed an order for 12 heavy-duty lathes. The concern will buy more shell-making machinery later.

The Pittsburgh Export Company has been organized by J. Rogers Flannery, of the Flannery interests in Pittsburgh. Frank J. Lanahan, the Fort Pitt Malleable Iron Company; Charles J. Graham, the Graham Nut Company, and J. J. Nordman, former secretary of the Foreign Trade Commission, Pittsburgh, are president, vice-president, treasurer and secretary, respectively, of the new company. Offices have been opened in the Farmers Bank Building. The company represents W. Dederich, Ltd., London, and Masters & Co., Ltd., Montreal, Canada.

W. A. Thomas, president of Brier Hill Steel Company, Youngstown, denies the report that his company is to build a third blast furnace in the Youngstown district. The company owns and operates Grace and Tod furnaces, but has no intention of building another stack, largely because of the very high prices for materials, and the great delays that would ensue in the delivery of equipment.

Will Use Enfield Rifle

WASHINGTON, May 16, 1917—(By Wire).—The General Munitions Board announces that the use of the British Enfield rifle by American troops raised for service abroad has been decided upon. This action has been contemplated for some time and was foreshadowed in the statement recently made to the House of Representatives by Congressman Tilson, published elsewhere in this issue. A considerable number of plants in this country have been making this rifle for the Allies and are therefore equipped with gages, jigs, etc., for its production in very large quantities. It is understood there are now nearly 1,000,000 of these rifles either completed or nearly so. Hence their adoption by the American army would not embarrass the Allies who still have large contracts unfilled.

Good Promise for Foundry Exhibition

C. E. Hoyt, manager of the department of exhibits, American Foundrymen's Association, reports that at the end of the third week of the association's campaign for exhibitors at the convention to be held at Boston, Sept. 25 to 28, 1917, 60 applications for space had been received. The total amount of space asked for is 17,940 sq. ft., an average of 299 sq. ft. In the first three weeks of the exhibit campaign in 1916, the total of applications received was 27, which was a record up to that time and the average amount of space used at last year's exhibition was 257 sq. ft.

To Make Ship Material at Ojibway

Work on the plant of the Canadian Steel Corporation at Ojibway, Canada, is to be actively pushed for making ship plates and ship shapes. An appropriation has been made by the United States Steel Corporation for buildings and the installation of machinery.

Machinery Markets and News of the Works

MUNITION WORK SPEEDS UP

Industry Keen to Push the Work Ahead

New 3-In. Gun Plant Takes \$400,000 Worth of Tools—Eastern War Plants Draining Market—War Taxes Feared

War work has now assumed first place in the metal-working industries. Heavy buying to this end, confined mostly to the larger markets, is forestalling every effort to catch up on deliveries. Aside from the steady scattered purchasing for shop upkeep, the bulk is from munition makers and producers of the rapidly growing list of accessory fighting equipment. Much has been placed and some big lots are pending.

The General Electric Company at present is the heaviest buyer. For equipping a new plant for making 3-in. guns the Root & Van Dervoort Engineering Company has bought about \$400,000 worth of machine tools. Tool builders in New England have not received many orders of late from shops on war work, as they are so far behind on delivery. Even some of the few they have secured have been cancelled on them. At Detroit inquiry has several times met with complete refusal on account of the requisition of the entire plant output by the Federal authorities. Fear is felt at Chicago lest heavy purchases by Eastern munition companies will prevent Western buyers from getting vitally needed equipment.

A growing hesitancy was evident in New York the past week to the placing of orders for domestic needs. War taxes and uncertainties are blamed by some for this. At Detroit automobile manufacturers are uneasy about the diversion of steel and raw materials and war levies on earnings, and are holding back, awaiting the outcome.

The cost problem will likely prove an increasingly troublesome burden to both buyer and seller alike. In the Middle West tool builders are harassed by machinists' strikes and mounting costs. Price advances are announced daily on one or more lines, and at Cincinnati have been rather generally recorded.

Export inquiry is good, particularly for Russia; but political chaos there has held up the placing of orders.

New York

NEW YORK, N. Y., May 16, 1917.

The machinery trade is quite generally strong, particularly with those dealers who handle the larger sizes of standard shop equipment. The activity centers naturally around Government requirements and further instances of the appropriation by shipbuilding, munition and similar plants of machine tools intended for other manufacturers are reported. Action is yet to be taken by some large purchasers of forging machinery required for war work. Domestic orders for such tools are not numerous and no immediate tendency is found for business in this line to liven up, although quite a few forge-shop additions are under way, especially in New England. A slackening of inquiry and a tendency to hold off on purchases is noted in some quarters, and is attributed to failure to secure authority for expected Government contracts and to unlooked-for delays at Washington. Deliveries are unimproved. Scattered business coming from a wide variety of industries for shop upkeep is now the principal source of

demand. Evidence is found that growing labor and material costs are inducing some purchasers to hesitate at buying high-priced equipment. New makes of lathes, particularly of the smaller sizes, are more than able to meet the present call for that class of tools. Local dealers are practically all cleaned out of large-sized planers and boring mills, both new and second-hand. In some cases such types of equipment available are now said to be old tools that in many shops would be classed as relics. Desirable machines, which occasionally appear on the market for immediate delivery, are snapped right up. One local house disposed of about 25 drills the past week in this manner.

The General Electric Company is still placing orders against its recent list estimated to total over \$1,000,000 in value. Among its recent purchases were 18 turret lathes. The Midvale Steel Company has purchased several forging machines for its current needs. Fergus Motors of America, Newark, N. J., has been before the market for general equipment. The railroads are quiet, but the Lehigh Valley will probably buy shortly. No heavy business is reported from the steel shipyards, although the Standard Shipbuilding Corporation, New York, is seeking some machinery for its Shooters Island plant. The Newport News Drydock & Shipbuilding Company, Newport News, Va., has a fund for covering its latest machine-tool requirements.

Export inquiry is quite good, particularly from Russia, where it originates from a great variety of sources, mostly for car-building and automobile shops. Little inclination, however, is shown to close at the present for such needs. Good business is being done with Norway and an order was recently taken for \$150,000 worth of gun-boring machines for France. Some price changes are recorded, but no general movement of this character. One manufacturer of radial drilling machines increased his prices 10 per cent, and a maker of sensitive drills added 10 to 15 per cent to quotations. It is reported that recent orders for large quantities of munition-making machinery were placed without any concession from the market, except on delivery.

The Bijur Motor Lighting Company, River Front and Sixteenth Street, Hoboken, N. J., has increased its capital stock from \$650,000 to \$2,000,000 to take care of increased volume of production. It recently moved into its new plant, which is three or four times the size of its former one. A strong demand for starting and lighting systems for motor trucks, motorboats and aeroplanes has put an increased strain upon its production.

The Sharp Rotary Ash Receiver Company, Binghamton, N. Y., has increased its capital stock from \$100,000 to \$300,000, \$150,000 preferred and \$150,000 common. The increase was made necessary on account of its anticipated expansion in business. The company contemplates putting up a building of its own for the manufacture of its ash receiver parts which are now purchased outside of the city. A. D. Klages is president and general manager; W. G. Phelps, Jr., is vice-president; and D. S. Phelps is secretary and treasurer.

The General Electric Company, Harrison, N. J., has awarded a contract for its proposed new plant on Lillie Street, near Seventeenth Street, Newark, N. J., at a cost of \$360,000. The structure will be four-story and basement, 82 x 512 ft., brick and concrete. The F. W. Mark Construction Company, Philadelphia, is the contractor.

The Butterworth-Judson Company, Avenue R, Newark, N. J., manufacturer of chemicals, has filed plans for a one-story addition, 44 x 107 ft., to cost \$14,000.

The Centrifugal Cast Iron Pipe Company, Newark, N. J., has been incorporated with a capital of \$1,250,000 to manufacture pipe, engines, boilers and similar products. James Flockhart, associated with the Maher & Flockhart foundry, 60 Polk Street, Newark, is the principal incorporator. Other incorporators are Edward DeV. Tompkins and Dimitri S. deLavand, New York.

The New Jersey Sheet Metal Workers, 62 Ann Street, Newark, N. J., have been incorporated with a capital of \$125,000 to manufacture boilers, etc. Ralph B. Schmidt, Ralph B. Schmidt, Jr., and Christopher O'Rourke are the incorporators.

The Ezo Corporation, Providence, R. I., has acquired property from the Nickelsburgh Brothers Company, Newark, N. J., manufacturer of leather, on Meadow Street, near the Lincoln Highway, for the manufacture of lubricating oil and lubricants. The plant covers an area about 50 x 200 ft.

The New Jersey Cutlery Company, 473-5 Washington Street, Newark, N. J., has been organized to manufacture

scissors and other cutlery specialties. Max Theis, 107 Hartford Street, and Gustav Wester, 3 Springfield Avenue, are the proprietors.

Powell & Co., 91 Oliver Street, Newark, N. J., operating a jewelry manufacturing plant, have filed articles of incorporation under the name of the Powell Company, with a capital of \$25,000. The incorporators are John C. Lapp, Theodore Clark and Frederick L. Schultz.

The Lionel Mfg. Company, 617 South Twenty-first Street, Irvington, N. J., manufacturer of electrical toys, has filed plans for a two-story addition to its plant, 77 x 82 ft., to cost \$15,000.

The Lyon Garage & Machine Company, 1299 Springfield Avenue, Irvington, N. J., has been organized to operate a machine shop and garage. Fred J. Caesar, 141 Hillside Avenue, and Harvey W. Banks, 130 North Walnut Street, East Orange, are the proprietors.

The Driver-Harris Wire Company, Middlesex Street, Harrison, N. J., has filed notice of change in its name to the Driver-Harris Company, at the same time increasing its capital.

Alexander Morton, Jersey City, N. J., operating a machine shop and lumber working plant at the foot of Henderson Street, will erect a one-story extension to cost about \$2,000.

The Standard Motor Construction Company, 180 Whiton Street, Jersey City, N. J., manufacturer of marine oil and gas engines, has filed plans for a one-story addition to cost about \$6,000.

The New Jersey Paper Tube Company, Nordhoff, near Englewood, N. J., has increased its capital from \$25,000 to \$90,000. Louis S. Coe is president.

The Stillman & Hoag Incorporation, Englewood, N. J., has been incorporated with a capital of \$25,000 to manufacture automobile accessories. Walter and E. W. Stillman, and Daniel D. Hoag, Tenafly, are the incorporators.

The Babcock & Wilcox Company, East Third Street and Lexington Avenue, Bayonne, N. J., manufacturer of boilers, is planning the erection of additions to its boiler and marine shops. The company has recently completed the construction of extensions to other sections of the plant at a cost said to be over \$200,000.

The Port Johnston Dry Dock Company, Port Johnston Dry Dock, Bayonne, N. J., has been incorporated with a capital of \$20,000 to operate a boat building and repair plant. Theodore C. Ballou, Richard B. and Henry J. Rodermand are the incorporators.

Fire May 11, destroyed a portion of the plant of Thomas A. Edison, Inc., Lakeside Avenue, West Orange, N. J., manufacturer of talking machines, disk records, etc., with loss estimated at about \$20,000.

The Board of Water Commissioners, Perth Amboy, N. J., has authorized a bond issue of \$200,000 for improvements at the municipal waterworks. The work will include new pumping machinery, boilers and auxiliary equipment, with necessary buildings.

The Aeromarine Plane & Motor Company, East Keyport, N. J., has commenced the installation of machinery at its new plant. The initial works comprise an area 150 x 300 ft., and will be used for the manufacture of seaplanes.

The Walden-Hinners Company, Edgewater, N. J., has been incorporated with a capital of \$100,000 to manufacture aeroplanes and other aircraft. Henry W. Walden and Edward F. and John H. Hinners are the incorporators.

John H. Waters, 26 Bayard Street, Belleville, N. J., has become president of the American Forging Company of Lakeview, near Paterson, recently incorporated with a capital of \$100,000. The proposed plant will be located in the Clifton section. It is said that the plans provide for the employment of about 200 hands. John Travers, 266 William Street, Belleville, is secretary and treasurer.

The Wearwell Rubber Company, Garfield, N. J., has been incorporated with a capital of \$60,000 to manufacture rubber specialties. Isidor L. Broadwin, Garfield, and Herman Mendes and C. A. Kavner are the incorporators.

Heiss & Ganns, 518 East One Hundred and Thirty-third Street, New York, operating a wagon and wagon parts manufacturing plant, have filed plans for a one-story shop addition, 35 x 95 ft., to cost \$10,000.

The Moran Towing & Transportation Company, 17 Battery Place, New York, has acquired the former shipbuilding plant of the Southern Shipbuilding Company, Mill Creek, Staten Island, for a reported consideration of about \$50,000. The property has a water frontage of about 700 ft. It is said that the new owners are planning the establishment there of a boat repair works for its scows, dredgers, etc.

The Chatham Machine & Tool Works, Inc., New York, has been incorporated with a capital of \$25,000 to manufacture engines and machinery. H. Brudney, J. Jacobs and J. Preuss, 557 West 187th Street, are the incorporators.

The American Conduit Company, 140 Nassau Street, New York, has commenced the erection of a new plant at Fulton, N. Y., for the production of electrical conduits and similar specialties.

The Sharp Rotary Ash Receiver Company, Park Avenue, Binghamton, N. Y., has increased its capital from \$100,000 to \$300,000.

The Moore Steam Turbine Corporation, Wellsville, N. Y., has increased its capital from \$160,000 to \$260,000.

The Meteor Engine Corporation, Tonawanda, N. Y., has been incorporated with a capital of \$100,000 to manufacture engines, motors and other apparatus. W. C. Berling, T. S. Hemenway and H. J. Drake, all of Buffalo, are the incorporators.

The Globe Mills & Fulton Woolen Company, Boston, Mass., will build a power plant on Court Street, Utica, N. Y. M. Russell, 819 Court Street, Utica, is the engineer.

The Star Iron Works Company, Gowanda, N. Y., has been incorporated by W. W. Watson, C. E. Gauschwind and D. H. Foster with a capital stock of \$75,000 to manufacture iron and steel products.

The Donning Carburetor Corporation, Esopus, N. Y., has been incorporated with a capital stock of \$300,000 to manufacture carburetors and engines. G. W. Donning, R. Grant and A. K. Barker are the incorporators.

The Rochester Stamping Company, Rochester, N. Y., is having plans prepared for a brick and steel factory addition, 45 x 170 ft., two stories.

The Rome Mfg. Company, Rome, N. Y., has completed plans for an additional factory building, 42 x 310 ft., two stories, to be erected on Railroad Street. E. L. Spriggs is manager.

The International Railway Company, Buffalo, will build additions to its power plant at Niagara and Albany streets.

The Aluminum Castings Company, Buffalo, will build a one-story foundry addition, 130 x 260 ft., to its plant at Elmwood and Hertel avenues and the Erie Railroad.

The Lehigh Valley Railroad Company has taken out building permit for erection of an engine house at its Tift Farm terminal, near Buffalo, to cost \$200,000.

The Buffalo, Rochester & Pittsburgh Railway Company has awarded contracts for new shops at East Salamanca, N. Y., including machine and erecting shops, blacksmith shops, storehouse and a transfer table, to cost approximately \$500,000.

The Empire Mfg. Company, Lockport, N. Y., is having plans completed for an addition to its plant at Market and Exchange streets.

The Geneva Cutlery Company, Geneva, N. Y., manufacturer of razors, shears, etc., has increased its capital stock from \$60,000 to \$600,000. It has increased its manufacturing facilities many times within the past few months, but plans a vigorous campaign to increase business, in spite of the fact that it is somewhat over 150,000 dozen razors oversold at present.

New England

BOSTON, MASS., May 14, 1917.

There has been little news of moment among machine-tool manufacturers the past week. Most of those who have been seen say that, so far, they have not seen much pressure from Government sources, direct or indirect. While there have been heavy purchases of machine tools directly for Government work, most of them have been placed elsewhere than in New England. The fact that New England manufacturers have been sold up so far ahead has been a factor in this. In one instance, part of a contract for lathes was practically placed with a New England maker, but was suddenly withdrawn, the understanding being that quicker delivery could be secured from a factory in the central states.

The navy yard at Boston is asking bids on a considerable amount of new equipment, including a drop hammer, an engine lathe, boring mills, drilling machines and milling machines. Bids close May 15 at Washington.

Several new plants are now being equipped, for which the orders were placed some months ago. Little demand is found for equipment for new plants in New England at this time. Machine-tool manufacturers in most instances report receiving many inquiries, mostly for single machines. These orders are being accepted for delivery in the order of their receipt.

The Wood Boiler Company, New Bedford, Mass., is moving its equipment to Vancouver, B. C., where it has a large order for marine boilers for the Cunard line steamers being built on the Pacific coast. Future plans in relation to the New Bedford plant are indefinite, but it is likely that the plant will be continued and an office will be maintained in New Bedford.

The Colonial Brass Company, Middleboro, Mass., which

has awarded a contract for a factory, 30 x 60 ft., one story, is pending the matter in abeyance.

The National Iron Works, Hartford, Conn., has been incorporated with capital stock of \$20,000 to manufacture ornamental and structural steel and iron. The incorporators are H. Krasnow, L. Jaffer and Nathan A. Schatz, all of Hartford.

The Specialty Nail Company, Raynham, Mass., has begun the construction of an addition, 50 x 150 ft., two stories. Herbert C. Dean, North Raynham, is treasurer.

The Empire Knife Company, Winsted, Conn., is to build a one-story forge shop, 20 x 60 ft.

The Atwater Mfg. Company, Southington, Conn., has begun the erection of an addition of 100 ft. to its polishing room, and of a 70-ft. extension to its forge shop.

The J. T. Slocumb Company, 35 Oxford Street, Providence, R. I., has awarded a contract to the O. D. Purrington Company, Providence, R. I., for an addition, 50 x 90 ft., two stories.

The New London Ship & Engine Company, Groton, Conn., has begun work on an addition, 110 x 125 ft., one story, for a forge shop.

The Bridgeport Brass Company will build two additions to its Standard Brass & Copper Company plant at New London, Conn. One building will be 60 x 145 ft., one story; the other, 45 x 65 ft., one story.

The Scovill Mfg. Company, Waterbury, Conn., has secured a permit for an addition, 106 x 193 ft., one story.

The American Brass Company, Waterbury, Conn., has started work on an addition, 172 x 200 ft., one story.

The Merrow Company, Hartford, Conn., is having plans drawn for an addition, 47 x 97 ft., three stories, to its plant on Laurel Street.

The A. C. Gilbert Company, New Haven, Conn., has awarded a contract for a boiler house, 46 x 80 ft., one story.

The J. M. Lapointe Company of Massachusetts, Hudson, Mass., has been incorporated with capital stock of \$60,000 to manufacture forging and machine tools. The directors are Joseph M. Lapointe, president; Ridgely F. Hanscomb, Newton Center, treasurer; and O. A. Wyman. The company is asking bids on a machine shop, one story, 85 x 300 ft.

The Backus Corporation, Boston, Mass., has been incorporated with authorized capital stock of \$50,000 to do a general foundry and machine business. The directors are Frederick E. Backus, 112 Portland Street, Boston, president and treasurer; A. L. West and C. S. Beatty.

The Southington Hardware Company, Southington, Conn., has awarded a contract to the H. Wales Lines Company, Meriden, Conn., for an addition, 50 x 150 ft., three stories and basement.

Philadelphia

PHILADELPHIA, PA., May 14, 1917.

The Ream Foundry Company, Lebanon, Pa., recently purchased from J. C. Boyd by J. R. and H. G. Umberger, will continue to manufacture sash weights, hard iron, brass, bronze and aluminum castings. It proposes to equip for the manufacture of gray-iron castings up to 500 lb. in weight. Eventually the company will install a small machine shop. The electrical construction business of J. R. Umberger will be continued and enlarged.

The Steel Plate Products Company, Pottstown, Pa., has opened temporary offices at 1034 Queen Street, and is arranging to erect a mill and office building. Railroad sidings are under construction and contracts for machinery and equipment are being placed. S. R. Morris is treasurer.

The Allentown Standard Mfg. Company, 725 Hamilton Street, Allentown, Pa., recently incorporated to manufacture sheet-iron ware, has purchased ground along the Lehigh Valley Railroad upon which it will erect a factory 75 x 100 ft., two stories. Dr. Harry J. Berman, Philadelphia, is president; Samuel R. Schatz, 733 Walnut Street, Philadelphia, is vice-president; J. Franklin is secretary, and Samuel I. Periman is treasurer. The company has also purchased a factory at Somerville, N. J., and will erect another plant as soon as the plans are approved. The plant at Allentown is to be completed within a few months and put in operation. The plans are being drawn by Ruhe & Lange, architects, Allentown, and will probably be completed in a few days. Work will be started at once.

The Weatherly Foundry & Machine Company, Weatherly, Pa., which recently at its annual election decided to enlarge its plant, has now concluded to hold up the proposed improvement indefinitely on account of the high cost of material and the scarcity of labor. Thomas J. Drumbor was elected president; J. Milton Stauffer, vice-president; Elmer Warner, treas-

urer and general manager; Wilson P. Long, secretary. L. Bannan is general superintendent.

The Lansdale Foundry Company, Lansdale, Pa., is extending its plant by the erection of a new core room, shipping room, machine shop and requisition building. H. I. Landis is president and general manager.

The S. A. Ashman & Son Company, 2300 East Tioga Street, Philadelphia, manufacturer of iron and steel forgings, has filed plans for improvements in its forge shop to cost about \$2,500.

The Philadelphia Drying Machinery Company, Westmoreland and Stokley streets, Philadelphia, has awarded a contract for the erection of a one-story addition, 110 x 125 ft., and a power plant, 35 x 40 ft., to cost \$65,000.

Frank Schanz, 407 North Randolph Street, Philadelphia, manufacturer of wagons and wagon parts, has filed plans for a new shop addition to cost about \$5,200.

The Crew Levick Company, Land Title Building, Philadelphia, manufacturer of refined oils, is having plans prepared for its proposed new plant on Petty's Island, Delaware River, opposite Philadelphia. The initial works are estimated to cost \$300,000.

The Nice Ball Bearing Company, Hunting Park Avenue and Henry Street, Philadelphia, manufacturer of pulleys, bearings, etc., is having plans prepared for a one-story, reinforced-concrete addition.

H. P. Eldman, Philadelphia, has awarded a contract for the erection of a one-story addition, 60 x 100 ft., to his machine shop at Erie Avenue and D Street, to cost \$10,000. The Pomeroy Construction Company, 1609 Ransstead Street, is the contractor.

The Philadelphia Rubber Works, Third and Reed streets, Philadelphia, has filed plans for an addition to its machine shop to cost about \$9,000.

The Hess-Bright Mfg. Company, Front Street, Philadelphia, manufacturer of pulleys and hangers, is planning extensions in its plant. The company is affiliated with the S. K. F. Ball Bearing Company, Hartford, Conn., and operated by the S. K. F. Administrative Company, 11 Wall Street, New York, recently organized for this purpose.

The proposed new shop building to be erected on Quarry Alley, Trenton, N. J., by the Trenton School of Industrial Art, will consist of a two-story building, providing about 12,000 sq. ft. of floor space. The different departments will comprise machine shop, foundry and forge shop, to be fully equipped for instructive courses of study; a wood-working department, ceramics and modeling works, as well as section for rubber technology will also be included. The complete shop building is estimated to cost \$40,000, and arrangements are now being made to provide this fund for early erection. Frank F. Frederick is director.

The Imperial Porcelain Works, Mulberry Street, Trenton, N. J., manufacturer of electrical porcelain goods, will prepare plans for its proposed new plant at Neptune City, with the intention of having the factory in operation next fall. The plant is estimated to cost \$25,000. Arrangements have been made for the purchase of a site. Frederic A. Duggan and B. B. Dinsmore are proprietors.

The Jaffray Mfg. Company, Trenton, N. J., has been incorporated with a capital of \$50,000 to manufacture chemicals. Benjamin D. Phillips, New York, and L. E. Conover and Harry H. Umberger, Trenton, are the incorporators.

The Eddystone Ammunition Corporation, Eddystone, Pa., is having plans prepared for four additions to its plant, to replace the structures recently destroyed by fire.

The North American Motor Company, Pottstown, Pa., has awarded a contract for the erection of a new two-story, brick and steel plant, about 50 x 72 ft. F. H. Kaiser & Co., Pottstown, have the contract.

The National Aniline & Chemical Company, 100 William Street, New York, is reported to be planning for extensions to the plant of the Benzol Products Company, Marcus Hook, Pa., recently acquired, with intention of making this one of its principal plants.

The Light Mfg. & Foundry Company, Union and Queen streets, Pottstown, Pa., manufacturer of aluminum specialties, is having plans prepared for the erection of a new two-story addition, 50 x 110 ft. It is also considering the construction of two three-story extensions, 30 x 175 ft., and 50 x 200 ft., respectively, to provide increased capacity.

The Fleetwood Metal Body Company, Fleetwood, Pa., manufacturer of metal automobile bodies and parts, is having plans prepared for a three-story addition, 60 x 125 ft. Wayne M. High, 11 North Fifth Street, Reading, is architect.

A one-story reinforced-concrete machine and engine room, 25 x 65 ft., will be erected in connection with the new meat-packing plant to be constructed at Chestnut and Second

streets, by Simon & Sherman, 135 Grape Street, Reading, Pa. Bids for erection are now being taken.

The Scranton Iron & Steel Company, Allentown, Pa., has opened an office in that city in charge of E. L. Manor and is proceeding to locate its plant there. It is acquiring a site of five acres with suitable trackage. It manufactures metal machine guards and fire escapes.

The Messer Mfg. Company, Philadelphia, has been incorporated with a capital stock of \$20,000 to manufacture welding and cutting machinery and apparatus. The incorporators are Eugene G. Pfanner, 3627 Ridge Avenue; George F. Pfanner, 5708 Market Street, and George Rueck, 439 South Sixty-second Street, all of Philadelphia.

The Universal Chain Company, Stroudsburg, has been incorporated with a capital stock of \$50,000 to manufacture wire, chains and machinery. The incorporators are Louis Lauport, Charles Robertson and H. L. Moyer, all of New York City.

The Allentown Standard Mfg. Company, Allentown, recently incorporated to manufacture galvanized buckets, dishpans, bread boxes, etc., has bought a tract along the Lehigh Valley Railroad for the erection of its plant.

The Salem Brass & Iron Foundry Company has completed the reconstruction and remodeling of the Hess Steel Company plant at Bridgeton, N. J., which is now ready for machinery and equipment. It is reported it will not be ready at once to start operations because of delay and difficulty in securing machinery and equipment.

Baltimore

BALTIMORE, MD., May 14, 1917.

Announcement has been made that Fairbanks, Morse & Co., Chicago, Ill., will establish a plant in Baltimore, and has closed a deal for the purchase of the Charles White Gas Engine Company, Charles and Winder streets. Additions will be made to the White plant and when they are completed a force of about 300 mechanics will be employed. The plant will manufacture a semi-Diesel marine engine. In a statement announcing the plans it is said that the demand for these engines, which are being manufactured at a subsidiary plant, the Sheffield Car Company, Three Rivers, Mich., has become so great that additional facilities were necessary. The deal by which the White Company was taken over was closed by C. H. Morse, Jr., president; W. E. Miller, vice-president, of Chicago; and Henry J. Fuller, vice-president, of New York. At present the company has a sales branch at 101 Light Street, Baltimore, in charge of W. M. Bastable.

The Southern Shipbuilding Company, Dover, Del., has been incorporated by Herbert E. Latta, C. L. Rimlinger and Clement M. Enger, all of Wilmington, to build boats and to conduct shipbuilding yards. The company is capitalized at \$1,000,000.

Robert J. Gill, 609 Keyser Building, Baltimore, represents interests which are considering the construction of a shipbuilding plant near Baltimore for building wooden vessels. No announcement of plans has been made.

The Bureau of Yards and Docks, Navy Department, Washington, will receive bids until 11 a. m., May 21, for the construction of a steel frame foundry building at the Navy Yard, Norfolk, Va.

The York River Shipbuilding Corporation, Richmond, Va., with \$1,000,000 capital stock, has made application for a charter and will erect a plant near West Point, Va. Warner Moore, Richmond, is president; Crosby Thomas, West Point, vice-president; James Mullen, Richmond, secretary, and Oliver J. Sands, Richmond, treasurer.

Jameson, McKenzie & Evans, 403 East Center Street, Baltimore, iron and steel dealers, have purchased a city block at Bayard and Wicomico streets, but officials of the company state that they have no intention of improving the property in the near future.

The Baltimore Tube Company, Baltimore, Md., advises that reports of a contemplated installation by the company of a copper sheet rolling mill are entirely premature. The company has no plans at present and business conditions in the next year or so will determine its action on any such proposition. The company has awarded a contract to the West Construction Company, American Building, for the construction of a one-story addition, 62 x 83 ft., to cost about \$6,000.

Louis A. Tarr, Inc., 203 West Conway Street, Baltimore, has been incorporated with \$50,000 capital stock to deal in machinery, engines, boilers, tools, etc. The incorporators are Louis A. Tarr, Howard W. Read and Carl R. McKenrick.

The Tredegar Company, Richmond, Va., has had plans drawn and has awarded contract to J. T. Wilson & Co., Mutual Building, Richmond, for the erection of a one-story munition building, 96 x 169 ft. Archer Anderson is president.

Chicago

CHICAGO, ILL., May 14, 1917.

Orders for an immense number of machine tools have been placed by the Root & Van Dervoort Engineering Company, East Moline, Ill., the share of Chicago houses amounting to about \$400,000. The East Moline company has a contract with the Government for 3-in. guns and gun mounts for the execution of which a new plant will be necessary. It manufactures gas and gasoline engines, and is not new in the munitions line, having previously made shells and single-purpose lathes. It is regarded as probable that part of the contract will be sub-let. Other orders from the Government are expected.

The Grand Trunk System, which usually buys at Montreal, has placed a few orders the past week, principally for heavy machines. The Chicago, Milwaukee & St. Paul has closed for a small number of tools, while the Pennsylvania also has bought at Pittsburgh for Chicago delivery. From feeders which have been put out, it is expected that a Western road will in a few days issue a very large list, but definite information is not yet available.

The scattered miscellaneous demand keeps up at an excellent rate, despite long deliveries. The trade is apprehensive that the heavy purchases made by munitions makers in the East will make tools so difficult to procure that Western buyers cannot be properly cared for. War demands are creating a new pressure of demand for lathes, the larger sizes of which are exceedingly scarce. In fact, heavy machines of every description are in great demand. This is particularly true of large planers, radial drills and boring mills. Manufacturers of the heavier tools are feeling the high prices now ruling for pig iron, inasmuch as the main castings require a great deal of iron. Some sizes of milling machines are almost impossible to get.

Not only high prices, but strikes among machinists and molders are harassing tool builders in the West. The Western Electric Company recently took a large number of ball-bearing drilling machines, and a Chicago company is now inquiring for several large gang drills.

The Peoria Malleable Castings Company, Peoria, Ill., has been incorporated with a capital stock of \$175,000 by L. E. Roby, George T. and Gerald H. Page, to establish a plant to supply manufacturers having difficulty in obtaining malleable castings.

The Illinois Central Railroad is reported to be planning the expenditure of about \$250,000 for improvements at Clinton, Iowa. The plans provide a new power house, enlargement of the machine shops and improvements to the round-house.

The Rippley Boat Company, Grafton, Ill., manufacturer of steel boats, has been merged with the Shallow Water Boat Company of New York. It will continue under the style of the Rippley Boat Company, which has a capital stock of \$100,000. Land has been leased on which a new shop will be erected.

The Imperial Belting Company, Lincoln and Kinzie streets, Chicago, has taken over the four-story fireproof building adjoining its present plant, which will double the factory space. Most of the machinery has been purchased and delivered and it is expected that the addition to the plant will be in operation by the end of May.

The American Foundry & Equipment Company, Chicago, has been organized by Richard Fitzgerald, J. C. Schwartz and L. I. Bretz, the capital stock being \$10,000.

The general contract has been awarded for a three-story factory, 100 x 200 ft., at Twenty-fourth and Federal streets, Chicago, for Bauer & Black, manufacturers of medical and surgical supplies, to cost about \$150,000.

A one-story factory, of reinforced concrete and steel, 100 x 600 ft., is to be constructed at Miller, near Gary, Ind., for the International Airship Corporation, 36 South State Street, Chicago. It is stated that the factory, which is to cost about \$100,000, will have a capacity of 500 machines per year. Bids have been taken.

The Brown Specialty Machinery Company, Elmer A. Rich, president, 2424 West Twenty-second Street, Chicago, has leased a factory, 75 x 150 ft., to be erected at Maplewood Avenue, near Forty-eighth Street, and equipped with a traveling crane. McKeown Brothers, 112 West Adams Street, have the general contract.

A one-story addition, 25 x 70 ft., is to be built at a cost of \$3,000 to the factory of Otto Zobler, engaged in copper and tank work, at 336 North Oakley Boulevard.

The Imperial Belting Company, Lincoln and Kinzie streets, Chicago, has taken over the four-story, fireproof building adjoining their present plant and will double its manufacturing floor space. Most of the machinery is on the ground and it expects to have the plant addition in operation some time this month.

The Grant Wire Wheel Mfg. Company, Chicago, Ill., has been incorporated in Delaware with a capital of \$250,000 to manufacture wire wheels and kindred automobile products. J. G. Morris, H. Lewis, and C. W. Shaeffer, Chicago, are the incorporators.

The Lamson Truck & Tractor Company, Chicago, has been incorporated in Delaware with a capital of \$2,000,000 to manufacture motor trucks, tractors, etc. W. D. Bradfield, Grover D. Harris, Elliott J. Perkins, C. B. Ludly and B. R. Hoffman, all of Chicago, are the incorporators.

Milwaukee

MILWAUKEE, WIS., May 14, 1917.

The demand for single tools and small lots from scattered sources continues unabated. No purchases have as yet been made on Government account, although considerable business has resulted from placing Government contracts with private manufacturers. England and France continue to buy heavily, taking all of the milling machines it is possible to get. The continual stream of orders coming into local shops has made it impossible to gain a single day on deliveries, which are still seven to nine months behind. While more skilled and semi-skilled workmen could be used if available, especially in the foundry trade, there is no dire shortage of labor.

The Four Wheel Drive Automobile Company, Clintonville, Wis., maker of motor trucks, at a special meeting May 1 decided to erect another addition to the plant, 100 x 180 ft., one-story, of brick and concrete. The capacity of the plant has been increased about four-fold within two years. The capital stock is now \$1,000,000. W. A. Olen is president.

The Manitowoc Foundry & Machine Company, Manitowoc, Wis., is buying about \$5,000 worth of shop equipment to handle several large contracts. George Smith is president.

The Keystone Brush & Machine Company, Milwaukee, has been organized with \$25,000 capital stock by Harry Worshill, John Dostal and Henry Kirchner.

The Hamilton-Beach Mfg. Company, Racine, Wis., electric motors and appliances, has awarded a contract to A. H. Harens, 822 Fourteenth Street, Racine, for the construction of a three-story brick and mill addition, 45 x 100 ft. Fred J. Oslus is president and general manager.

The Four Wheel Tractor Company, Antigo, Wis., organized to manufacture farm tractors, has selected Clintonville, Wis., as the location of its proposed plant and headquarters. The first unit will be erected this summer if delivery of materials and equipment can be assured.

The Ziola Mfg. Company, Milwaukee, has been incorporated with a capital of \$20,000 to manufacture electrical devices, including X-ray machines and electro-therapeutic apparatus. The incorporators are H. A. Ziola, Madison, Wis., Dr. Theodore H. Rolfs and E. W. Bentzien. Plans are not yet ready for publication.

The Miller Fruit Company, Marshfield, Wis., has plans for a three-story brick and concrete cold storage warehouse and refrigerating plant, 75 x 80 ft., to cost about \$50,000.

The Spring City Foundry Company, Waukesha, Wis., gray iron founder, has broken ground for an addition, 80 x 140 ft., of steel, concrete and brick.

The Merrill Sheet Metal Works, Merrill, Wis., has been incorporated with a capital stock of \$25,000 by W. L. Alpine, George Pavlik and L. J. Belott.

The Wausau Mfg. Company, Wausau, Wis., has commenced work on the construction of its wood-working factory, 38 x 145 ft., two stories and basement, to be ready Oct. 1. The company was recently organized with Russell Lyon, president; George E. Foster, vice-president, and Henry E. Smith, secretary-treasurer.

The electric light and waterworks commission, Shawano, Wis., has recommended the installation of a 250-hp. direct-connected Corliss engine and motor-driven pumps. J. Caprano is superintendent.

The Wilbur Lumber Company, 905 Pabst Building, Milwaukee, will erect an addition, 38 x 266 ft., to the mill-working department at Waukesha, Wis. Hawley Wilbur, Waukesha, is general manager.

The Hercules Steel Casting Company, 501 Free Press Building, Milwaukee, expects to decide on a site for its proposed foundry group, involving an expenditure of about \$100,000, within the next 10 days. Estimates are being received on the equipment, including two 20-ton cranes, with 70-ft. span and one 10-ton outside crane, with 100-ft. span. E. B. Gennrich is secretary.

The Western Fixture Company, 573 East Water Street, Milwaukee, is removing to its new plant at Humboldt and Concordia Avenues. The company manufactures metal display fixtures and operates a welding department. Felix Biegelar is general manager.

The Elkhorn Factory Company, Elkhorn, Wis., has awarded the general contract to John Kinnare, Oak Park, Ill., for the erection of a two-story and basement factory, 65 x 250 ft., for the Frank H. Holton Company, Chicago, manufacturer of band instruments. The building will cost \$40,000 and the equipment an additional \$10,000 or \$15,000. The architects are Miller & Hall, Chicago.

The Aluminum Castings Company, Cleveland, Ohio, has engaged F. A. Parkhurst, architect and engineer, to prepare plans for its new foundry and finishing plant at Manitowoc, Wis., to be 200 x 300 ft., of fireproof construction. The company recently sold its present plant to the Aluminum Goods Mfg. Company, Manitowoc, which takes possession when the new foundry is completed about Oct. 1.

The A. W. Woodman Company, Joliet, Ill., which was organized by A. W. Woodman, president Joliet Bridge & Iron Works, to take over and operate the former structural and boiler plant of the Lyons Boiler Works, DePere, Wis., has been incorporated under the style of the DePere Mfg. Company, with a capital stock of \$150,000. Mr. Woodman continues as president and M. M. Kruse, Chicago, is secretary-treasurer. The general offices will be in Chicago. The former Lyons works have been completely remodeled and improved.

Charles Sibenhorn, Two Rivers, Wis., is establishing a shop for the manufacture of an electrical heating device for attachment to steam and hot water heating boilers.

The Marsh-Bothe Machinery Company, Chicago, has opened a branch sales office in room 205, 144 Oneida Street, Milwaukee.

The recent incorporation of the Warner Mfg. Company, Beloit, Wis., with a capital stock of \$50,000, supersedes the same corporation which had previously operated under an Illinois charter. The incorporators are A. P. Warner, A. B. Cadman and Max Herrmann.

An item which appeared in THE IRON AGE of April 26 erroneously stated that the Milwaukee Electric Crane & Mfg. Company, Milwaukee, has booked orders which will keep its plant busy for more than six months. As a matter of fact the company is quoting on shipment in 3½ to 4½ months and has the plant and facilities enabling it to make deliveries in this time. It recently acquired the former plant of the Fred M. Prescott Steam Pump Company, West Allis, Wis.

Detroit

DETROIT, MICH., May 14, 1917.

The machine-tool market continues dull while manufacturers are adjusting their affairs to conform with present conditions. In the automobile field local makers who last year turned out \$600,000,000 worth of cars are afraid of the 5 per cent tax on receipts which is proposed by the Government. Manufacturers point out that this tax will take 50 per cent of the profits of the more prosperous companies, and will mean the extinction of the small firms. Automobile manufacturers are also uneasy about the diversion of steel and other raw materials by the Government and are consequently holding back, awaiting final settlement. Machine-tool dealers are also facing a serious situation. Inquiries for machines in many cases have met with a complete refusal to quote on them, manufacturers stating that the Government had requisitioned their output. Labor is scarce and well paid.

The Union Drawn Steel Company, which has general offices in Beaver Falls, Pa., is occupying its Detroit warehouse on Joseph Campau Avenue, between Guoin and Wight streets. This building carries cold drawn steel exclusively.

The manufacturing plant and other property of the Alter Motor Car Company, Plymouth, Mich., will be sold.

The United Motor Truck Company, Grand Rapids, Mich., is having plans made for a building, 75 x 300 ft., as an addition to its plant in the north end and construction will begin soon. The company now has four buildings, two recently completed. The new building will be for the manufacture of an improved tractor with capacity for 6 to 8 tons with trailer. About 1500 skilled mechanics are now employed and when the new building is completed the force will be enlarged.

The Dobbie-Detroit Steam Motor Company, Detroit, capitalized at \$10,000,000, has been organized by men prominent in the automobile world and manufacturing plans are under way. Contracts have been made for parts and materials and options have been obtained on completed plants for operations.

The American Motor Truck Company, Detroit, has purchased a factory with 40,000 sq. ft. of floor space at Copeland Avenue and the Michigan Central tracks, and is preparing to manufacture 2, 3½ and 5-ton trucks.

The controlling interest in the Regal Motor Car Company has been sold by its Detroit directors to Chicago financiers. The company is capitalized at \$3,000,000 and it is the intention to increase the production of motor cars. Maurice Rothchild, with Harris Brothers, Chicago bankers, has assumed general supervision of the company.

The General Motors Company, Pontiac, Mich., has broken ground for the first building of a factory group to manufacture tractors. The new plant will be 120 x 250 ft. W. L. Day, general manager, is in charge of the work.

The Dail Steel Products Company, Lansing, Mich., manufacturer of metal containers, has broken ground for an addition, 72 x 120 ft. This is the first step in a plan which includes several buildings. The company recently increased its capital stock to \$100,000 and is now working on Government orders.

Cleveland

CLEVELAND, OHIO, May 14, 1917.

Considerable inquiry is noted for machine tools, orders for which are contingent on securing Government orders. Among these is one inquiry for 100 screw machines and another for 50 screw machines for fuses. Some additional business has been placed by the Government, including eight turret lathes for the Portsmouth Navy Yard. The general demand for small lots of machine tools continues very active, business coming from widely scattered sources. Automobile manufacturers and tire makers are among the most active buyers. One order for eight boring machines for 1918 delivery was placed the past week by a machine shop allied with the tire industry. A new inquiry is pending from an Ohio automobile accessory manufacturer for 25 to 30 machines. Traction car builders are buying equipment and glass manufacturers are also in the market. The demand for electric traveling cranes continues very heavy, many inquiries coming from ship-builders.

G. F. Mitchell & Son, Cleveland, makers of sheet metal stampings, are having plans prepared for the erection of a plant on a new site recently acquired.

The Art Metal Mfg. Company, Cleveland, has increased its capital stock from \$15,000 to \$125,000.

The Ferry Cap & Screw Company, Cleveland, will erect a factory addition to be used for annealing and storage purposes.

The Erie Dock Company, Cleveland, has taken bids for a shop and office building, 80 x 150 ft.

The Allen-Osborn Company, Cleveland, will erect a factory, 98 x 350 ft., with a wing, 25 x 83 ft., to be used as a blacksmith shop.

The Rittman Machine Company is being organized at Rittman, Ohio, to establish a foundry and machine shop and has been incorporated with a capital stock of \$25,000. J. H. Smith, S. J. Jones, J. C. Young and others are interested.

The Barnard Toy Company, Toledo, Ohio, has been incorporated with a capital stock of \$35,000 by Don C. Barnard, and others, and plans to erect a factory to manufacture small metal toys.

The Willys-Overland Company, Toledo, has had plans prepared for a boiler house, 30 x 40 ft., for its Elyria, Ohio, plant. The contract will be placed shortly.

The Western Gas Fixture Company, Toledo, will erect a two-story factory and store building, 60 x 110 ft.

The United Roll & Foundry Company, Ravenna, Ohio, has placed the first unit of its new plant in operation and plans to erect another building this summer for the manufacture of cold chilled rolls and rolling mill machinery.

The Sandusky Nut Company, Sandusky, Ohio, has been incorporated with a capital stock of \$50,000 by Oliver Brace, E. L. Marsh, William B. Moon and others. It has taken over the plant of the Marsh-Brightman Nut Company, which it will occupy for the present. Later it is planned to erect a modern factory building.

The Wagner Refrigeration Company, Sandusky, has been incorporated with a capital stock of \$250,000 to manufacture a gas operated ice making machine for use in residences. Charles L. Wagner, Cleveland, is president; Fred K. Marshall, Sandusky, vice-president; J. E. Hermann, secretary; Charles Zimmerman, treasurer, and Otto E. Bornhauser, general manager.

The Lakewood Engineering Company, Cleveland, has taken over the plant of the Duplex Foundry & Mfg. Company, Elyria, Ohio, which will continue to be operated under its present name. A plant extension will be built at once, doubling its capacity, and a 20-ton cupola will be added. A. L. Ehrbar, formerly with the Dunham Company, Berea, Ohio, has been made president of the Duplex Company.

The Unckrich Mfg. Company, Gallon, Ohio, has disposed of its automobile and bicycle accessory manufacturing business to the Economy Repair & Tire Company, Gallon, and will close and dismantle its plant.

Cincinnati

CINCINNATI, OHIO, May 14, 1917.

Automobile manufacturers are only buying machine tools where replacements are necessary. Auto-truck builders are better customers, although no lists have been issued lately from this source. Railroad buying has also been curtailed, and a general tendency is noted to purchase machinery only when absolutely needed. Quite a number of machine tools have been diverted by the Government lately to firms with contracts directly related to the war demand for munitions and equipment. Work on machines needed by the Government has been speeded up voluntarily. Export business is only fair and new orders are scarce. As so much business has been booked ahead this condition affords some relief in filling requirements that have been on the books for several weeks. The high cost of castings, steel, labor, etc., has forced an advance on all kinds of machinery. An almost unprecedented demand exists for boring mills from domestic customers.

It is reported, but not officially confirmed, that the Acme-Greaves Machine Tool Company, Cincinnati, will build a plant on a site secured in the Oakley district. This firm is a combination of the Acme Machine Tool Company and the Greaves-Klusman Machine Tool Company.

Work is progressing rapidly on the new plant of the Champion Tool Works Company, at Winton Place, Cincinnati. Practically all equipment has been purchased.

The Wadsworth Watch Case Company, Dayton, Ky., a Cincinnati suburb, has let contract for a one-story brick addition to its plant, 66 x 230 ft.

The Eagle Cordage Company, Covington, Ky., has decided to electrify its plant, and will require several small motors.

The Seifreat-Woodruff Company, Dayton, Ohio, has been incorporated with \$25,000 capital stock by C. Seifreat, E. E. Burkhart and W. T. Pickrel, to deal in new and second-hand machine tools. A branch office has been established in Cincinnati.

The Columbus Wire & Iron Works Company, Columbus, Ohio, has increased its capital stock from \$20,000 to \$45,000. Nothing is known as to its plans for enlarging its capacity.

The D. A. Ebinger Sanitary Mfg. Company, Columbus, Ohio, has increased its capital stock from \$100,000 to \$200,000 and will add equipment to increase the capacity of its plant nearly 75 per cent.

The Paramount Motor Company, Columbus, has been incorporated with \$100,000 capital stock by Jesse F. Hatcher and others.

Information has been received that the Carbo-Hydrogen Company of America, with headquarters in Pittsburgh, Pa., will establish a branch plant at Columbus, Ohio.

The Huntington Steel Foundry Company, Huntington, Ind., will erect a two-story addition to be used as a pattern shop.

The McJunkin Machine Company, Lesterville, W. Va., will erect a branch plant at Winchester, Ky. It makes a specialty of repairing oil well machinery.

The Central South

LOUISVILLE, KY., May 14, 1917.

An improved outlook is reported by manufacturers of steam boilers, who note a number of promising inquiries. The material situation, however, is described as desperate, while coal has gone to unheard of price levels with the end not in sight and no improvement in the car supply. Canning plants are closing down for lack of cans. Labor is becoming increasingly scarce and it is reported some towns are undertaking to conserve their supply by license taxes on visiting labor agents.

The Kentucky Wagon Mfg. Company, Louisville, Ky., will erect a forge shop to cost about \$50,000. Several steam hammers ranging up to 5 tons have been purchased.

The Black Diamond Coal & Mining Company, Drakesboro, Ky., is in the market for boilers, hoisting engine and other mine equipment.

The Henley Skate Company, Richmond, Ind., has been incorporated with a capital stock of \$30,000 by M. C. Henley, J. H. Williams and P. W. Smith, to make roller skates.

The Sells Lumber & Mfg. Company, Jonesboro, Tenn., has increased its capital stock from \$50,000 to \$75,000.

The Kingsport Packing Company, Bristol, Tenn., has been incorporated in Virginia with a stock of \$100,000 to establish a meat packing plant at Kingsport, Tenn. John N. Johnson, Gate City, Va., is president; J. C. Stone, Kingsport, is secretary.

The John G. Duncan Company, Knoxville, Tenn., is asking for dealers' prices on a used jaw crusher, 60 x 80 in. or larger, for quick delivery.

Birmingham

BIRMINGHAM, ALA., May 14, 1917.

Maximum activity in mine, milling and furnace fields more than makes up for the dullness in structural operations. Electrical equipment is in steady demand.

The following shipbuilding activities are reported at Mobile, Ala.: The Henderson Iron Works will install about \$300,000 worth of machinery for shipbuilding; J. F. Coleman and associates have optioned a site and propose to build shipyards; Rolf Seeberg, Mobile and New Orleans, proposes to construct shipyards; Varian C. Scott is to build shipyards; the Murnan Shipbuilding Corporation, chartered with \$3,000,000 capital, has acquired the Murnan shipyards and will develop them; the Alabama Drydock & Shipbuilding Company will add to its shipbuilding equipment; the Barrett Shipbuilding Company will invest about \$300,000 in a plant; Horace Turner, Mobile, and Eastman, Gardner & Co., Laurel, Miss., lumbermen, are planning to erect a shipbuilding plant.

The Appalachian Corporation, Tallulah Park, Ga., maintains its New York office at 55 Wall Street, not 364 Broadway, as has been stated.

St. Louis

ST. LOUIS, MO., May 14, 1917.

While the machine-tool market has been rather quiet the past week the aggregate of business has kept up sufficiently to give little excuse for complaint. The dullness has been more in the placing of orders for distant delivery, rather than in the current equipment operations and the prospect of renewed activity is regarded as good.

The Machine Products Company, St. Louis, has been incorporated with a capital stock of \$10,000 by Joseph and Louis Desloge and Franklin McDermott and will manufacture rheostats, generators, dynamos, etc.

The A. McDannold Mfg. Company, St. Louis, has been incorporated with a capital stock of \$12,500 by James A. Davis, Leon M. Schlenker and Robert E. Maloney and A. McDannold, to manufacture surgical instruments.

The Multipull Mfg. Company, St. Louis, has been incorporated with a capital stock of \$25,000 by Charles W. Bardenheier, Orion S. Miller, Robert N. Eggleston and others to manufacture a folding windlass and ground stake equipment for automobiles.

The Cement Machinery and Supply Company, Kansas City, Mo., has been incorporated with a capital stock of \$15,000 by T. G. Newbill, John Taylor and R. D. Gross.

The Walsh Fire Clay Products Company, Vandalia, Mo., will equip a power plant and install clay-working machinery under the engineering supervision of the Unit Construction Company, St. Louis. About \$500,000 will be invested.

The American Machinery Company, Kansas City, Mo., Produce Exchange Building, George W. McClanahan, president, will install equipment for the manufacture of a shoe-cleaning machine.

The Riverland Levee District, Louisiana, Mo., John Cherry, president, will install equipment for an oil-driven pumping plant, under plans by the Jacksonville Engineering Company, Jacksonville, Ill. Bids until May 21.

The Bristow Pressed Brick & Tile Company, Bristow, Okla., has been incorporated with a capital stock of \$25,000 by Sam Allen and others of Sapulpa, and will install brickmaking machinery.

The Oklahoma City Brick & Tile Company, Oklahoma City, Okla., has been incorporated with a capital stock of \$100,000 by Frank Wells, W. C. Lee and O. R. Rittenhouse.

The Braden Gin Company, Quinton, Okla., has been incorporated with a capital stock of \$15,000 by W. S. Braden and others and will equip a cotton gin.

The Farmers' Cotton Oil Company, Ada, Okla., has been incorporated with a capital stock of \$100,000 by N. B. Haney, Jr., W. J. Coffman and J. D. Lasater and will equip a cotton oil mill.

The Danwinger Oil & Refining Company, Drumright, Okla., will equip an oil refinery of 800 bbl. per day capacity.

The New Wilson Refinery Company, New Wilson, Okla., will add \$30,000 to its capital and extend its plant capacity to 3000 bbl. per day.

The Atwood Refining Company, Oklahoma City, Okla., has been incorporated with a capital stock of \$1,000,000 by Weston Atwood, R. W. Carson and I. S. Mahan and will equip an oil-refining plant.

The Dixie Engineering Company, Enid, Okla., capitalized at \$210,000, will install lathes, millers grinders, heavy and light-duty drill presses, planers and shapers, all with direct connected motors. P. H. Shaklee is president.

The E. L. Sill Pneumatic Horse Collar Company, Oklahoma City, Okla., capitalized at \$250,000, will install equipment to cost within \$60,000, with a capacity of 1000 to 2000 collars per day. Fred Wegner, Woodward, Okla., is president.

Waynoka, Okla., is receiving bids for oil-burning engines, direct-connected alternating generators and other electrical equipment. A. B. Simonds is town clerk.

The Louisiana Cooperage Company, Plaquemine, La., will rebuild its plant recently destroyed with a loss of \$40,000.

A shipbuilding plant is to be equipped by a company reported capitalized at from \$10,000,000 to \$15,000,000, at Chalmette slips, in New Orleans. John W. Thompson, St. Louis, is in charge.

The W. R. Pickering Lumber Company, Pickering, La., will rebuild and re-equip its sawmill and power plant recently burned with an estimated loss of \$100,000.

Texas

AUSTIN, TEX., May 12, 1917.

An increase in the sale of cotton gin machinery has been noted the past week. Recent rains have greatly enhanced the prospects for a large cotton crop and preparations are being made for installing many new gins. A number of additional cotton-seed oil mills and compresses will probably be built before the new crop comes on.

The Peavy Rubber Company, Dallas, has been incorporated with a capital stock of \$100,000 to manufacture rubber goods. Ralph A. Peavy is a stockholder.

The Pierce Pipe Line Company, which has begun laying an 8-inch pipe line from the Healdton field in Oklahoma to its refinery at Fort Worth, will construct four pumping stations along the route.

The Farmers' Gin Company, Mabank, has been incorporated and will build a cotton gin to cost \$10,000. T. E. Tippin is a stockholder.

The Texas Electric Light & Power Company, San Angelo, has been incorporated with a capital stock of \$200,000 for the purpose of building and operating an electric light and power plant. The incorporators are Ralph J. Irvine and M. F. Treadwell, San Angelo, and Charles W. Hobbs, Dallas.

The Planters' Gin Company, Howe, will build a cotton gin to cost about \$7,500. R. E. Hollingsworth is a stockholder.

Beaudett & Croper, El Paso, will install additional machinery and enlarge their cold storage plant at a cost of about \$10,000.

The Farmers' Gin Company, Rutersville, has been incorporated and will build a cotton gin to cost about \$10,000. H. Amberg is a stockholder.

The Shippers Compress & Warehouse Company has increased its capital stock from \$400,000 to \$500,000 and will enlarge its cotton compress.

The Star Clay Products Company, Elmendorf, will double the capacity of its brick and tile plant at a cost of more than \$100,000. Adolph Wagner, San Antonio, is president.

The Gonzales Cotton Mill Company, Gonzales, has been reorganized and plans to install additional machinery in its cotton mill. The mill has been idle for about five years.

The Cleburne Cotton Compress Company, Cleburne, will install new machinery and make improvements to its cotton compress at a cost of about \$25,000.

California

LOS ANGELES, CAL., May 10, 1917.

The Moreland Motor Truck Company, 1701 North Main Street, Los Angeles, has plans for a one-story addition, 50 x 185 ft.

The Simplex Fuel-Oil Engine Company, Los Angeles, has been incorporated with a capital of \$75,000 to manufacture oil engines. Lawrence Valentine, W. B. Slaughter, Joseph W. Hohmann, Timothy and Peter E. Spellacy are the incorporators.

The C. W. Hill Chemical Company, 326 San Pedro Street, Los Angeles, specializing in the manufacture of boiler compounds, etc., will build a new one-story plant, 65 x 270 ft., on San Pedro Street, near Sixth Street.

The Los Angeles Shipbuilding & Drydock Company, Los Angeles, is arranging for the immediate construction of its proposed new shipbuilding plant on property recently acquired on the west basin of Los Angeles Harbor. It is said that the plant will cost about \$1,000,000.

The Acme Pump Company, Los Angeles, has been incorporated with a capital of \$10,000 to manufacture pumps. The incorporators are Samuel C. Carter, H. H. Price and D. O. Kumbler, all of Los Angeles.

Edwin Forrest, 129 Fremont Street, San Francisco, Cal., has now incorporated his business into the Edwin Forrest Forge Company. The new company is about to install new equipment, so that it will have a complete and up-to-date general blacksmith and forge shop.

The Acme Gas Engine Company, San Francisco, recently organized, is to start the manufacturing of gas engines. C. C. Kriemler, former secretary and general manager of the Standard Gas Engine Company, will be president and general manager. Richard Froboese, formerly chief engineer of the Corliss Gas Engine Company, will be designer and mechanical engineer. It is planned to make engines from 7 to 125 hp.

The Pacific Northwest

SEATTLE, WASH., May 8, 1917.

Work on the various new shipyards still furnishes the bulk of the new business, with the same type of machine tools in demand as were called for throughout the past month. This is particularly true of wooden shipbuilding machinery, as this work on the whole Pacific Coast is being rushed. Electric power machinery is in good demand, and much work involving this kind of machinery is being planned for the early summer. There has been a noticeable improvement in the call for general machine shop and garage apparatus. Further advances in prices have been reported, without any apparent effect on trading.

Shipbuilding contracts now held by Seattle companies have mounted to a total of \$69,000,000, with several large contracts now pending. It is authentically stated that at least \$40,000,000 in contracts could be added to the present figures if local plants could accept further orders. Practically every large plant, however, is contracted for up to the end of 1918, and it is not considered advisable to accept additional contracts at this time. Many contracts for wooden hulls have been offered to Seattle plants, but the majority of builders are holding back to await the move of the Government. Portland, Columbia River and Oregon Coast shipbuilders are in a position to construct at least 100 of the wooden vessels, and facilities could be increased to produce many more. The plan decided upon to permit contractors to submit proposals for the building of hulls alone, if they prefer, independent of the boilers and machinery, has met with great favor on the coast.

Shipbuilding plants in this section have received contracts recently from the Government for making repairs to the German ships interned in the Northwest.

The construction of steel vessels has now become an important industry in Portland. The Northwest Steel Company is now employing 1950 mechanics, while other plants in the city have forces of 400 to 600 men. The car shortage prevailing has slowed up the arrival of construction material, and it is stated that as soon as delivery of this material may be depended upon every plant in the city will greatly increase its working force. A number of vessels have been delayed in completion due to this delay.

Lumber shows another increase in price, and the market is reported very strong. The demands sure to be made for ships to be built in the Northwest have greatly strengthened the market, for while only a certain percentage of the lumber cut is suitable for ships, there is a ready market for the balance. It is stated that demands upon the mills are almost abnormal. If cars were supplied as needed, the mills would probably be unable to supply the demand, as yards in the Middle West are calling for heavy stocks. Railroads are also in the market for bridge timbers, ties and other lumber. A recent inquiry at Portland mills is for 100,000 ties.

The management of the Veterans' Home at Sedro-Wooley, Wash., is to install a power house to cost \$35,000.

The Coos Bay Shipbuilding Company, Marshfield, Ore., has been incorporated with a capital stock of \$50,000 by A. E. Adelsperger, R. H. Corey, John D. Gess and Arno Mereon. A site has been purchased at Marshfield and four sets of ways will be put in to handle the contracts from the Government.

Frank W. and Asa B. Cutler, Hood River, Ore., are to erect a factory for the manufacture of apple-grading machines to fill contracts from Australia.

Alex Hironymous, Freewater, Ore., is to install new equipment in his machine shop. He is adding 1200 sq. ft. of floor space.

The Columbia River Shipbuilding Company, Vancouver, Wash., has been incorporated with a capital stock of \$50,000 by L. B. Menefee, R. V. Jones and A. L. Miller. A lease on 1300 ft. of water front has been taken and ways for constructing four vessels will be laid.

The Standard Shipbuilding Company, Vancouver, Wash., has been incorporated with a capital stock of \$100,000 by W. G. McPherson, A. H. Devers and J. C. Eldred. Four sets of ways will be built.

A shipbuilding company, as yet unnamed, has been organized by R. W. Hill, Seattle; J. M. Frere, Wilmington, Del., and others. The plant will be located at South Bend, Wash., on the Willapa River and orders for four 3000-ton vessels have already been taken.

The American Shipbuilding Company, Warrenton, Ore., has been incorporated for \$1,500,000 by R. M. Skidmore, M. H. Eggleston and C. T. Diamond, and will locate a shipbuilding plant there.

The Raymond Shipbuilding Company, Raymond, Wash., has been incorporated by W. G. Shumway, R. W. Hill, J. M. Frere and C. E. Phillbrick to build wooden ships of 2000 to 3600 tons capacity.

The Butte Carriage Works, Butte, Mont., will erect a two-story concrete machine shop and garage, 75 x 112 ft., to cost \$22,500.

The city of Portland, Ore., plans construction of a municipal machine shop.

The Coast Shipbuilding Company, Portland, recently incorporated by Arthur M. Sherwood, Donald M. Green and Charles E. McCulloch for \$400,000, has taken over the property of the Heath Shipbuilding Company, Portland, and will construct two sets of ways.

The Washington Shipbuilding Company, Tacoma, Charles A. McMasters, president, has recently signed contracts with eastern interests for seven 8800-ton steel cargo ships, costing about \$1,000,000 each.

The Great Falls Iron Works, Great Falls, Mont., will construct a structural steel shop, 70 x 75 ft., one story, costing \$25,000; a foundry costing \$50,000 and a pattern shop costing \$10,000. Work has already been started on the structural steel shop.

The sawmill of the Grant Lumber Company, Harrison, Idaho, was recently destroyed by fire, with a loss of \$65,000. The fire started in the boiler room. It will be rebuilt. W. E. Grant is president.

The Stone & Webster interests, represented in Seattle by the Puget Sound Traction, Light & Power Company, Seattle, have recently leased about 75 acres of harbor lands near Seattle, on which proposed shipbuilding plants will be erected, it is reported.

The Hofius Steel & Equipment Company, Seattle, has let contracts for construction of its proposed new steel plant at First Avenue South and Spokane Street. Plans provide for a structural shop, 50 x 300 ft., a warehouse, 30 x 300 ft., and a machine shop, 60 x 150 ft.

The Varney Shipbuilding Corporation, Seattle, has filed articles of incorporation for \$500,000, and purchased a site at Edmonds, Wash., where a wooden shipbuilding plant will be established. F. W. Peabody is president.

The Washington Handle Company, Eleventh Street, Tacoma, Wash., plans to double the output of its plant. Two new buildings will be built, a drying house and machinery building, and new equipment will be installed throughout the plant.

The Beaver Wood Products Company, Portland, Ore., plans the establishment of a factory in Philomath, Ore., to manufacture tool handles, brush and broom handles, law furniture, ladders, and kindred products. Truman J. Glover is president.

Canada

TORONTO, CANADA, May 14, 1917.

The Welland Shipbuilding Company, Ltd., Welland, Ont., will within the next few weeks begin the manufacture of steel freighters at Welland, and it is expected that the first deliveries will be made before the close of navigation. The company has recently been incorporated with a capital stock of \$200,000. The shipyards and machine shop of M. Beatty & Sons, Ltd., have been leased for a term of years. An additional slip will be built on the Welland Canal and an addition to the shops will also be erected. About 100 men will be employed at the start. The vessels will be of steel, and of 3000 tons capacity, fitted for either lake or ocean traffic. Among those interested are F. H. Keefer, K. C., of Thorold, Ont.; W. Davidson, H. M. Balfour, H. F. J. Estrup and others of St. Catharines, Ont.

Three Rivers, Que., Z. Lambert, city engineer, is in the market for 2 pumps with a daily capacity of 2,500,000 gal. 3 stages, and 2 pumps with a daily capacity of 3,000,000 gal. 3 stages.

Wettlauffer Brothers, 180 Spadina Avenue, Toronto, will build a foundry and machine shop at Fredericton, N. B.

A. E. Wallbery, Royal Bank Building, Toronto, will start work shortly on the erection of an addition to the plant of the Canada Wire & Cable Company, 1170 Dundas Street.

Bids are in for the erection of a factory for the St. Catharines Cartridge Case Company, estimated to cost \$35,000. A. E. Nicholson, 46 Queen Street, St. Catharines, Ont., is architect.

The Three Rivers Casting Company, Hertel and Charleroi streets, Three Rivers, Que., will build a brick foundry to cost \$35,000 and is in the market for foundry machinery, lathes, furnaces, etc. A. B. Charleton is manager and engineer.

Robert, Dugre & Arseneau, Three Rivers, have been awarded the contract for the erection of a foundry for the St. Maurice Foundry Company, Three Rivers, to cost \$30,000. The Dominion Foundry Supply Company, Ltd., 47 Murray Street, Montreal, will buy the machinery and equipment.

The Standard Tube & Fence Company, Drew Street, Woodstock, Ont., will build an addition to its factory at a cost of \$5,000. J. L. Hosack is superintendent.

Contracts have been let for the erection of an addition to the plant of the Windsor Tool Machine Company, Windsor, Ont., to cost \$10,000.

The Brompton Pulp & Paper Company plans to install a dam, power house, electrical machinery, water wheels, turbines, generators and switchboard at East Angus, Que. The Montreal Engineering Company, 164 St. James Street, Montreal, is the engineer.

The International Shipbuilding Corporation, 323 Transportation Building, Montreal, is in the market for general requirements and equipment for a shipbuilding and repair plant.

The Brunner-Mond Company, a subsidiary of the Solvay Process Company, Detroit, Mich., will commence at once on the erection of a 16-story building to cost \$2,000,000. About 1000 men will be employed at the start.

The Hamilton Cement Company, in which Claude Bordier, Montreal, is interested, will build a plant at Point aux Trembles, Que., for the manufacture of cement, cement products, etc.

G. G. Elster of the Canada Car & Foundry Company is getting the plant at Fort William, Ont., ready for operation. This plant was erected some time ago, but because it was impossible to place orders for the machinery it was never put in commission. The company has decided that, instead of waiting for orders and then equipping, it will fit up the plant to be ready for operations at a moment's notice. Mr. Elster states that he expects to have it equipped and ready for work by the end of September.

J. J. Carrick, M.P., and associates will shortly commence the erection of a pulp and paper plant immediately outside the city limits of Port Arthur, Ont. The initial unit will turn out 360 tons of pulp per day and will represent an expenditure of approximately \$1,000,000. It will at first require 18,000 hp. It is the intention of the Ontario Hydro Electric Commission to develop Nipigon power for this purpose.

The Globe Films, Ltd., Toronto, has been incorporated with a capital stock of \$40,000 by Arthur Cohen, Oscar H. King, 15 Wellington Street East, Gordon H. Crouch and others to manufacture films, machines, accessories, etc.

The Great Eastern Pulp Company has been organized to erect and operate pulp and sawmills at Madeleine River, Gaspé County, Que. The officers are: President, John Mulen, Bangor, Me.; V. P. Archibald and Hay Cook, both of Quebec. There will be a bond issue of \$600,000 and a stock issue of a like amount. The company will erect a mill with an annual capacity of 30,000 tons of pulp and the annual output of the sawmill will be 10,000,000 ft.

Louis N. Fuller, Halifax, N. S., has organized the Tusket Shipbuilding Company, Ltd., and acquired old shipyards at Tusket, N. S., which will be equipped for operations immediately. The company also proposes to establish shipyards at other points in Nova Scotia.

The plant of the Manitoba Engines, Ltd., Brandon, Man., was damaged by fire with a loss of about \$10,000.

The Eureka Toy Company, Maisonneuve, Que., is preparing to build a factory to cost \$85,000.

The Grand Trunk Railway Company, Montreal, will build an addition to its locomotive erecting shops at Point St. Charles, Que.

The Canada Steamship Lines, Ltd., Montreal, proposes to build a drydock at Hamilton, Ont., to cost \$250,000. J. W. Norcross is vice-president.

Steel Lockers, Ltd., London, Ont., has been incorporated with a capital stock of \$40,000 by William P. Brown, Herbert J. Sutherland, Charles E. Jarmain and others to manufacture steel lockers, etc.

The Standard Machinery & Supplies, Ltd., Montreal, has been incorporated with a capital stock of \$250,000 by Walter R. L. Shanks, Gerald A. Coughlin, Francis G. Bush and others to manufacture machinery, tools, implements, etc.

The Canadian Utilities, Steel & Engineering, Ltd., Montreal, has been incorporated with a capital stock of \$49,000

by John Macnaughton, William B. Scott, James G. Cartwright and others to manufacture gages, tools, motors, engines, automobiles, machinery, etc.

The Hydraulic Machinery Company, Ltd., Montreal, has been incorporated with a capital stock of \$200,000 by George R. Drennan, Alexander G. Yeoman, Herbert W. Jackson, Francis G. Bush and others to manufacture hydraulic presses, pumps, accumulators, paper mill machinery, etc.

The Colonial Fastener Company, Ltd., Montreal, has been incorporated with a capital stock of \$20,000 by Casimir Desaulles of Westmount, Que.; Leon Garneau, Paul J. Lorrain and others of Montreal to manufacture fasteners, metal goods, etc.

The Wilson Carbon Paper Company, Ltd., Montreal, Que., has been incorporated with a capital stock of \$10,000 by Edgar C. Budge of Westmount, Que.; Charles G. Ogden, Harry A. Ellis and others of Montreal, Que., to manufacture type-writers, carbon paper, etc.

The Equipment Investment Company of Canada, Ltd., Toronto, has been incorporated with a capital stock of \$50,000 by Richard W. Hart, 1126 Traders' Bank Building; Charles H. R. Leggett, 40 Playter Boulevard; William W. Perry, Scarborough Junction, and others to manufacture machinery, tools, implements, etc.

The munitions plant and the Vitro tank plant of the Cluff Mfg. Company, 181 Sterling Road, Toronto, were destroyed by fire, May 11, with a loss of about \$250,000. The company was working on an order for \$200,000 worth of munitions, only \$40,000 of which had been completed. R. J. Cluff is president.

The Central Electricity Company, Ltd., Herbertville Station, Que., has been incorporated with a capital stock of \$99,000 by J. H. Bassard, J. R. Desbiens, A. Plourde and others to build and operate plants to generate electric light, heat and power, etc.

The Harrison-Lamond Contracting Company is completing arrangements for a site on the Fraser River at South Vancouver, B. C., where it proposes to establish a shipbuilding plant for the manufacture of wooden vessels, etc.

The Ellison Milling Company, Lethbridge, Alberta, plans the erection of an elevator to cost between \$100,000 and \$150,000.

Government Purchases

WASHINGTON, D. C., May 14, 1917.

Bids will be received by the Bureau of Supplies and Accounts, Navy Department, Washington, until May 22, schedule 1107, for two machines for spacing light angles up to 40 ft. long to a gage or strip, for Norfolk and Philadelphia; schedule 1108, for one 21-in. motor-driven upright drill, one 12-in. motor-driven double grinding machine, one 16-in. back geared screw-cutting engine lathe, and one toolroom crank shaping machine, all for Philadelphia; schedule 1109, for four cold metal sawing machines for Norfolk; until date not set, schedule 1111, for various turbo-generating sets for various deliveries.

The general purchasing officer of the Panama Canal, Washington, will receive sealed bids until May 18, under circular 2125, for one power belt-driven hacksaw, and until 10.30 a. m., May 19, under schedule 1141, for a motor-driven planer, a drill press, etc.

Bids were received by the Bureau of Supplies and Accounts, Navy Department, Washington, May 4, for supplies for the navy yards as follows:

Schedule 1036½, Steam Engineering

Class 1, Boston—One 20-ft. vertical boring and turning mill—Bid 152, \$48,280.

Class 2, Boston—One 8-in. spindle horizontal boring, drilling and milling machine—Bid 152, \$32,325.

Class 3, Boston—One 16-ft. x 12-ft. reversing motor-driven planer—Bid 152, \$72,040.

Class 4, Boston—One 120-in. motor-driven crank shaft lathe—Bid 152, \$44,120.

Similar bids were received May 8 for navy yard supplies as follows:

Schedule 928, Construction and Repair

Class 23, Lathes and carbon brushes—Bid 47, units: 94, \$3,351; 150, \$3,222.

Class 25, Portsmouth, N. H.—Saw tables and carbon brushes—Bid 35, \$1,048; 41, \$740; 47, \$1,308.70 and \$1,254.70; 86, \$1,061; 94, \$1,041.50; 150, \$971.80.

Class 26, Puget Sound and Portsmouth—Punches, shears, trimmers, etc.—Bid 86, \$2,150; 94, \$546; items 5 and 5a; 108, \$362, items 3 and 4.

Schedule 949, Construction and Repair

Class 61, Puget Sound—Motor-driven punch—Bid 59, \$4,205; 108, \$3,050; 152, \$3,372.

Alternate—Same, f.o.b.—Bid 59, \$3,755; 108, \$2,750; 125, \$2,620; 143, \$2,675; 152, \$2,854.

Class 62, Puget Sound—Motor-driven plate-joggling rolls—Bid 59, \$12,282.

Alternate—Same, f.o.b.—Bid 59, \$11,344.

Schedule 950, Steam Engineering

Class 71, Mare Island—Motor-driven lathe—Bid 60, \$7,166 and \$7,131; 65, \$6,394; 86, \$5,950; 140, \$5,819; 152, \$6,500.

Alternate—Same, f.o.b.—Bid 60, \$6,616 and \$6,581; 86, \$5,650; 152, \$6,030.

Class 72, Mare Island—Motor-driven wood planer—Bid 43, \$1,595; 60, \$1,606 and \$1,407; 71, \$1,580; 86, \$1,442 and \$1,312, f.o.b.; 94, \$1,425, \$1,450 and \$1,475; 103, \$1,725, \$1,530 (f.o.b.), and \$1,750; 145, \$1,665, \$1,705, and \$1,790; 148, \$1,509; 150, \$1,554.75; 47, \$1,606.33; alternate, \$1,407.12.

Schedule 996, Construction and Repair

Class 101, Brooklyn—Buffing lathe, 3600 r.p.m.—Bid 71, \$554.

Alternate—Same, 1800 r.p.m.—Bid 35, \$415; 71, \$549; 86, \$550.

Class 102, Brooklyn—Buffing lathe, 3600 r.p.m.—Bid 71, \$657.

Alternate—Same, 1800 r.p.m.—Bid 35, \$545; 71, \$636.

Schedule 998, Steam Engineering

Class 111, Portsmouth—Engine lathe—Bid 86, \$27,731 and \$27,300; 152, \$26,980 and \$42,970.

Class 112, Portsmouth—Turret lathe—Bid 69, \$2,617; 106, \$3,195; 144, \$4,203.

Class 113, Portsmouth—Milling machine—Bid 19, \$4,748.50.

Class 114, Portsmouth—Vertical shaping machine—Bid 90, \$2,331, \$2,551 and \$2,801; 102, \$2,582.

Schedule 1011, Ordnance

Class 143, Washington—Automatic screw machines—Bid 93, \$1,850.

Schedule 1013, Steam Engineering

Class 161, Core box machines—Bid 109, \$400; 107, \$10.50, not driven; 47, \$1,001.50.

Class 162, Boston—Tool room lathe—Bid 71, \$858 and \$1,019; 86, \$1,420; 106, \$858; 140, \$556.

Schedule 1014, Steam Engineering

Class 163, Charleston—Engine lathe—Bid 36, \$1,868; 46, \$2,273; 71, \$1,997 and \$2,224; 86, \$2,260; 87, \$1,820 and \$1,815; 152, \$2,590.

Class 164, Charleston—Drilling machines—Bid 46, \$252 and \$174; 71, \$350; 86, \$135; 87, \$165; 152, \$166.

Class 165, Charleston—One crank shaper—Bid 71, \$1,200; 86, \$920; 87, \$990; 152, \$1,282.

Schedule 1016, Construction and Repair

Class 171, Portsmouth—Compressors, pumps, etc., for submarines—Bid 66, \$238,956.06; 98, \$219,066; 141, \$213,180.

Schedule 1025, Ordnance

Class 181, Air compressors, f.o.b. works—Bid 66, \$35,203.14 and \$36,823.14; 91, \$26,174.28; 92, \$27,882 and \$28,132, alternate.

The names of the bidders and the numbers under which they are designated in the above list, are as follows:

Bid 19, Brown & Sharpe Mfg. Company; 26, Carroll Electric Company; 32, Chicago Pneumatic Tool Company; 35, W. Irwin Cheyney; 36, Driggs Ordnance Company; 43, Eby Machinery Company; 46, Fairbanks Company; 47, J. A. Fay & Egan Company; 59, Hilles & Jones Company; 60, Harron, Rickard & McCone; 65, Houston, Stanwood & Gamble Company; 66, Ingersoll-Rand Company; 69, Jones & Lamson Machine Company; 71, Kemp Machinery Company; 86, Manning, Maxwell & Moore, Inc.; 87, D. Nast Machinery Company; 90, Newton Machine Tool Works, Inc.; 91, Norwalk Iron Works Company; 92, Nordberg Mfg. Company; 93, National Acme Company; 94, Oliver Machinery Company; 98, Platt Iron Works; 102, Pratt & Whitney Company; 103, H. H. Plummer & Co.; 106, Henry Prentiss & Co.; 107, J. W. Paxson Company; 108, Perine Machinery Company; 109, Portland Company; 119, Rix Compressed Air & Drill Company; 122, Sullivan Machinery Company; 125, Southwark Foundry & Machine Company; 140, Ward & Co.; 141, Worthington Pump & Machinery Corporation; 143, Wickes Bros.; 144, Warner & Swasey Company; 145, Baxter D. Whitney & Son; 148, P. B. Yates Machine Company; 150, American Woodworking Company and 152, Niles-Bement-Pond Company.

A foundry addition 120 x 250 ft. is being erected by Farrar & Trefts, Inc., at its East Buffalo plant and will be equipped for handling castings up to 50 tons. The full equipment for the new plant, including three new traveling cranes, etc., has been purchased. Work on the erection of the plant was commenced May 8.

NEW TRADE PUBLICATIONS

Flue Welding Machine.—Southwark Foundry & Machine Company, Philadelphia. Circular. Illustrates a universal flue welding machine equipped with a heating furnace located immediately in front of the welding mandrel. A special feature of the machine is the working of the weld on the inside instead of the outside of the tube and simultaneous action of the clamping mechanism and the welding mandrel. A description of this machine, which was illustrated in THE IRON AGE, Nov. 23, 1916, is presented together with a brief table of specifications.

Drawing Die Calculator.—Otto H. Jensen, 44 Horton Place, Buffalo. Circular. Gives a set of directions for the use of a calculator for determining the maximum draw from a blank into a shell or from a shell into one of smaller diameter. A number of tables of useful information are included.

Bending Brakes.—Dreis & Krump Mfg. Company, 2909 South Halsted Street, Chicago. Catalog No. 15. Covers a complete line of bending brakes for every class of work including cornice, slotted box and pan and belt and motor-driven power brakes. The brakes will handle work ranging from 3 to 16 ft. in length and up to 1/2-in. steel plate.

Factory Illumination.—Cooper Hewitt Electric Company, 730 Grand Street, Hoboken, N. J. Calendar-pamphlet. Pertains to the use of Cooper Hewitt lamps for lighting industrial establishments of all kinds. Each of the six leaves of the pamphlet, which measures 12 1/2 x 18 in., contains a view of some industrial establishment in which these lamps have been installed and the calendar for one month. The calendar begins with May 1, 1917, and by reversing the pamphlet at the end of the first six months the dates for the remainder of the year are available, the engravings and the calendars being printed on both sides of each leaf. In connection with the illustrations brief mention is made of the special features of the installation.

Reinforced Concrete Construction.—Turner Construction Company, 244 Madison Avenue, New York City. Bulletin No. 20. Illustrates a few of the various industrial structures that have been built by this company, including factories, warehouses, piers, etc. The advantages of concrete buildings, such as resistance to fire, lower ultimate cost, permanence of construction, ability to shift machinery and shafting at will and the securing of better light and ventilation, are touched upon. In connection with the engravings of the various operations, a brief statement of the size of the building and the time required to construct it, as well as some of the special features, are given in the caption.

Industrial Plant Construction.—Westinghouse, Church, Kerr & Co., Inc., 37 Wall Street, New York City. Circular. Calls attention to the record made by the company in rebuilding the baled shavings building of the East St. Louis Cotton Oil Company in one week after it was destroyed by fire. The story is told briefly by six dates with statements of the condition of the work from the time the building was destroyed by fire until it was again in service.

Vertical Drilling Machines.—Minster Machine Company, Minster, Ohio. Circular. Describes and illustrates a vertical drilling machine which can be supplied with a plain table and rear drive or a compound table with side drive. The description is complete yet concise, each feature being emphasized by the use of bold type sideheads. A condensed table of specifications supplements the descriptive matter. The plain table type of machine was illustrated in THE IRON AGE, Nov. 23, 1916.

Vises, Machinery and Fine Tools.—Athol Machine Company, Athol, Mass. Two catalogs. The first, No. 32, calls attention to a line of vises of various types. These are illustrated and tables of the different sizes of each that can be supplied are presented under the engraving, a single page being devoted to one line. Mention is made of a line of pipe grips, grindstones and bench grinding machines. For ready reference the catalog numbers of the various tools on any page are repeated at the outer edge in large, heavy figures. The other catalog, No. 33, refers to an extensive line of fine tools such as calipers, dividers, rules, bevels, straight edges, squares, clamps, etc. The same arrangement is followed in this catalog of having an engraving at the top of the page with a brief table of the sizes that can be supplied underneath and the numbers of the different ones repeated in large type at the edges.

Quick Change Lathe.—Walcott Lathe Company, Jackson, Mich. Circular. Mentions a 20-in. lathe equipped with quick-change gear box, three-step cone pulley and double back gears that was illustrated in THE IRON AGE, Nov. 23, 1916. A description of the lathe is presented, together with an engraving and condensed table of specifications.

ESTABLISHED

Forg

NO small part of the steel industry is in heat-treatment proper less effort or forged piece of the steel man quality which treatment man locate such quality exist, but which out by poor handling of the other two.

It usually that neither manufacturer, man in charge of forging, nor the charge of the heat-treatment considers the very thorough investigation it requires. The result is that the forge man unconsciously continues to furnish ground for trouble by not fighting it for the other side to fight out. The data gathered by tests and the conclusions drawn would appear in a different light if the very important operations of forging were given proper attention.

Initial Heating Steel

Any heat-treatment process that does not have control of the heating and control of the cooling is incomplete. Heat treatment of the steel prior to the final cooling operation, assuming the steel is in proper condition in its chemical analysis when charged into the furnace.

Many of the defects in heat-treatment are common to the forging process.

"Copyright, 1917,
The Heat Treatment."